



LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA24 | Birmingham Interchange and Chelmsley Wood

Data appendix (LQ-001-024)

Land quality

November 2013

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Department for Transport

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Appendix LQ-001-024

Environmental topic:	Land quality	LQ
Appendix name:	Data appendix	001
Community forum area:	Birmingham Interchange and Chelmsley Wood	024

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1 Introduction

1.1.1 The land quality appendix for the Birmingham Interchange and Chelmsley Wood community forum area (CFA24) comprises:

- a summary of engagement undertaken (Section 2);
- detailed risk assessment (Section 3);
- inspection notes and other site data (Section 4);
- geological sites of special scientific interest (SSSI) and local geological sites (LGS) (Section 5); and
- mining and minerals data (Section 6).

1.1.2 Maps referred to throughout the land quality appendix are contained in the Volume 5, Map Book Land quality.

2 Engagement

- 2.1.1 Table 1 sets out the local authorities and other organisations that have been engaged with during the preparation of the land quality section of the environmental impact assessment for the Birmingham Interchange and Chelmsley Wood study area, the types of information that have been provided to the assessment team and any specific concerns of those engaged with.

Table 1: Engagement on land quality issues undertaken for the study area

Local authority or other organisation	Method / dates of contact	Information provided and/or specific concerns
Solihull Metropolitan Borough Council (SMBC) – Spatial Planning Department	Emails (2012 to 2013) Meeting 27 March 2013	<p>SMBC was contacted requesting information on mineral designations, mineral planning applications and landfill sites within Solihull. Responses were received via email in 2012 and 2013. Mineral designation geographical information system (GIS) shapefiles were received from SMBC on 3 July 2013, however the shapefiles did not contain all the mineral designation areas shown in the 2012 Draft Local Plan¹. SMBC confirmed that these missing areas should be included within the shapefiles and SMBC are investigating the issue. No response or updated shapefiles have since been received.</p> <p>A meeting was held on 27 March 2013 between the project team and SMBC at SMBC offices. Sites within the SMBC area were discussed in relation to their potential for re-use of surplus materials and the authority's plans for mineral working. SMBC provided a summary of sites discussed and also sent through further plans for Berkswell Quarry by email on 11 April 2013.</p>
SMBC – Environmental Health Department	Email (2012 to 2013) Meeting 19 March 2013	<p>SMBC was originally contacted in August 2012 regarding Information of contaminated land or potential contaminated land sites within Solihull - including a request for a GIS layer of potential contaminated sites within Solihull.</p> <p>A meeting was held on 19 March 2013 between the project team and SMBC to discuss land quality issues including contaminated land, mining and mining reserves and land designations.</p> <p>Following the meeting on 19 March 2013, SMBC provided information on Lavender Hall Landfill and Lincoln Farm Cafe Landfill on 21 March 2013.</p> <p>A GIS layer containing potentially contaminated sites was received on 21 June 2013. Further information was requested on potentially contaminated sites shown on the GIS layer within the study area on 25 June 2013 and a response was received on the 1 July 2013 containing the available records for each site.</p>
North Warwickshire Borough Council (NWBC) - Environmental Health	Email (2013)	The Pollution Control Officer at NWBC provided records on contaminated land investigations and assessments within the NWBC area. The provided records were not relevant to this

¹ Solihull Metropolitan Borough Council (2012); Solihull Draft Local Plan, Shaping a Sustainable Future, Local Development Framework, Pre-Submission Draft.

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Local authority or other organisation	Method / dates of contact	Information provided and/or specific concerns
Department		study area.
Warwickshire County Council (WCC) – Sustainable Communities Department	Email (2013)	Information was received on waste sites and designations on 31 January 2013. Mineral shapefiles containing operational mineral sites, preferred areas of mineral extraction and mineral safeguarding areas (MSA) were received via email on the 11 April 2013 and 12 April 2013.
Environment Agency	Contacted via e-mail / telephone from March 2013 to May 2013	<p>Request for information to the Environment Agency on 2 March 2013 requesting information on landfill sites and special / potentially contaminated sites within study area for the Environmental Statement. This was followed up by a telephone call on 11 March 2013 from which it was confirmed that the request had been passed on to the Midlands customer service desk with a response due by 19 March 2013. A reply was received on 16 May 2013, but attachments were missing; an email was sent on 20 May 2013 requesting the attachments, which were received on the same day. The information received included contaminated land records held by the Environment Agency along the route (as a consequence of planning application reviews Part 2A assessments etc.) and contaminated land site designations.</p> <p>In mid-May 2013, a collective approach was made to the Environment Agency requesting information regarding specific landfill sites and other sites of interest.</p> <p>A response was received on 7 August 2013 containing the available records.</p>
SITA UK	Email (2012)	SITA UK provided information on Packington Landfill (which is operated by SITA UK). The information provided via email included details on waste types accepted, mitigation measures at the site including gas and leachate containment and a figure showing environmental monitoring locations.

3 Detailed risk assessment

- 3.1.1 This section presents assessments for the higher risk potentially contaminated sites within the study area. For each site the following data is presented:
- baseline risk assessment;
 - construction risk assessment;
 - post-construction risk assessment; and
 - assessment of temporary (construction) and permanent (post-construction) effects.
- 3.1.2 Grouping has been applied in accordance to the methodology set out in the Scope and Methodology Report (SMR) Addendum in Volume 5: Appendix CT-001-000/2.
- 3.1.3 The purpose of the grouping is to enable the assessment of a large number of sites within the study area that share similar characteristics. The grouping as part of the detailed assessment considers the type of contamination, for example soil/groundwater contamination with or without a potential for ground gas to also be present. It also seeks to differentiate between potentially contaminated sites that fall directly within the land required to construct the Proposed Scheme and those which fall outside.
- 3.1.4 The groups are defined as:
- conceptual site model (CSM) Group A: Sites* that fall fully/partially within the land required to construct the Proposed Scheme, potentially affected by soil/groundwater contamination and ground gas;
 - CSM Group B: Sites* that fall fully/partially within the land required to construct the Proposed Scheme, potentially affected by soil/groundwater contamination only;
 - CSM Group C: Sites* that fall outside of the land required to construct the Proposed Scheme, potentially affected by soil/groundwater contamination and ground gas; and
 - CSM Group D: Sites* that fall outside of the land required to construct the Proposed Scheme, potentially affected by soil/groundwater contamination only.
- *'Sites' are defined as the Stage C potentially contaminated sites that have been identified following the screening process in Stages A and B².
- 3.1.5 The assessment of grouped sites is considered to be a high level assessment that is designed to distinguish between the key interactions that the different groups of potentially contaminated sites would have with the construction and post-construction stages of the Proposed Scheme. For the purpose of the grouped assessments the term "on-site users" refers to users of the potentially contaminated sites identified.
- 3.1.6 The sites assessed in this study area are set out in Table 2.

² These stages are described in the assessment methodology, set out in the SMR (Volume 5: Appendix CT-001-000/1) and the SMR addendum (Volume 5: Appendix CT-001-000/2).

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Table 2: Sites included in the detailed risk assessment within the study area

Site reference	Name
	Group A
1	Jacksons Brickworks Landfill (historical)
2	Infilled pond
5	Windbridge Nurseries Landfill (historical)
11	Infilled pit
16	Backfilled borrow pit
23	Infilled sand and gravel quarry
34	Backfilled borrow pit
38	Middle Bickenhill Lane Landfill (historical)
39	Infilled pit
40	Infilled pit
41	Packington operational Landfill
44	Brackenlands Farm Landfill (historical)
54	Coleshill Civic Amenity Site Landfill (historical)
	Group B
3	Cottage Farm
4	Dismantled Hampton-in-Arden to Shustoke line
9	Myrtle Cottage Farm and garage services
12	Park Farm Quarry (now named Stonebridge Quarry)
13	Former Smithy
32	Rugby to Birmingham line and Birmingham International station
36	Historic Warren Farm
37	Park Farm
43	Melbicks Garden & Leisure centre
46	Birmingham Business Park
58	Highways Agency Depot (operational)
	Group C
56	Infilled gravel pit
No sites identified within Group D	No sites identified

- 3.1.7 Contaminant types included within the risk assessments are based on the Department of the Environment, Farming and Rural Affairs (Defra) and Environment Agency (2002); *Potential Contaminants for the Assessment of Land* (CLR 8)³. Although this report has been withdrawn by the Environment Agency, there has been no subsequent authoritative document to replace it and it is still commonly used and considered good practice.
- 3.1.8 The remainder of this section presents the risk assessment for the sites going through to Stage C and D of the assessment. These sites are shown on Maps LQ-01-053, LQ-01-053-L1 and LQ-01-054a, (Volume 5, Map Book Land quality).
- 3.1.9 The following abbreviations are used in these tables:
- CSM- conceptual site model;
 - CoCP - code of construction practice;
 - PAH - polycyclic aromatic hydrocarbons;
 - PPE - personal protective equipment;
 - RAMSAR sites - wetlands of international importance, designated under the Ramsar Convention⁴; and
 - SSSI - site of special scientific interest.

³ DEFRA and Environment Agency, (2002); *Potential Contaminants for the Assessment of Land*.

⁴ Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), 2 February 1971. UN Treaty Series No. 14583. As amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987.

Detailed risk assessment - Group A

Table 3: Detailed risk assessment for Group A sites in the study area

Site ID (IDS)	1, 2, 5, 11, 16, 23, 34, 38, 39, 40, 41, 44, 54
Community forum area	Birmingham Interchange and Chelmsley Wood.
Site group	Group A: Sites within the land required to construct the Proposed Scheme, potentially affected by soil, groundwater and gas contamination.
Site title (Site ID) and land use class⁵	<p>Jacksons Brickworks Landfill (Site ID 1), historical landfill, class 3. Recorded as accepting inert, industrial, commercial, household and special waste from the 1990s. Bickenhill Household Waste Recycling Centre and other industrial business units are present in the north of the site.</p> <p>Infilled pond (Site ID 2), class 2, pond filled with unknown material.</p> <p>Windbridge Nurseries Landfill (Site ID 5), class 2. Recorded as accepting inert waste between 1979 and 1982. Records indicate that some unpermitted waste was disposed at the site including tree stumps and scrap metal.</p> <p>Infilled pit (Site ID 11), class 2 pit, filled within unknown material.</p> <p>Backfilled borrow pit (Site ID 16), class 1. Backfilled with unsuitable material associated with construction of M42. Trial pit records suggest the backfill material comprises reworked mudstone.</p> <p>Infilled sand and gravel quarry (Site ID 23), class 2, filled with unknown material.</p> <p>Backfilled borrow pit (Site ID 34), class 2. Backfilled with unsuitable material associated with construction of M42. Trial pit records suggest thick made ground deposits with frequent anthropogenic material.</p> <p>Middle Bickenhill Lane Landfill (Site ID 38), historical landfill, class 3. Recorded as accepting inert, industrial, commercial, household and special waste between 1962 and 1985.</p> <p>Infilled pits (Site IDs 39 and 40), class 2. Pits filled within unknown material.</p> <p>Packington Landfill (Site ID 41), class 3. Operational landfill operated by SITA UK under an Environmental Permit. Recorded to have accepted domestic waste, contaminated material and low grade radioactive waste. The site is fully lined with gas and leachate collection systems.</p> <p>Brackenlands Farm historical landfill (Site ID 44), class 3. Recorded as accepted inert and liquid/sludge waste including wastewater, sewage sludge and chemical waste mixed with municipal solid waste between 1975 and 1977.</p> <p>Coleshill Civic Amenity Site historical landfill (Site ID 54), class 3. Recorded to have accepted inert, industrial, commercial and household waste between 1964 and 1980.</p>
Receptors	

⁵ As defined by Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2).

Sensitive land use e.g. housing, schools, parks, playgrounds (adjacent and/or <50m)	Pasture Farm is located within Site 1. Site 2 is located within 50m of Cottage Farm. Site 16 is adjacent to residential housing along Middle Bickenhill Lane. Brackenlands Farm buildings are located within 50m of Site 41. Site 44 has farm buildings located on-site.
Aquifer e.g. Secondary A or Principal	Sites 1, 2, 23, 34, 38, 39, 40, 41, 44 and 54 are located on the Glaciofluvial Deposits Secondary A Aquifer. Site 5 is located adjacent to the Arden Sandstone Secondary A Aquifer.
Surface watercourses (adjacent and/or <50 m)	Site 5 is adjacent to Hollywell Brook (in culvert). Site 11 is approximately 50m from an unnamed tributary of Hollywell Brook and 15m from a pond. Site 23 is approximately 20m from an unnamed tributary of Hollywell Brook. Site 38 is adjacent to an unnamed tributary of the River Blythe. Various streams and drainage channels are located in Site 41. Unnamed streams are located on and adjacent to Site 54.
Geological or ecological designations e.g. SSSI or RAMSAR	Nursery Cottage Brickworks LGS is within part of Site 1. Site 54 is adjacent to Coleshill and Bannerly Pools SSSI.
Property e.g. mineral resources, buildings and structures, Grade 1 agricultural land	Various industrial and commercial buildings are located in the northern half of Site 1, especially along the boundary with the A45 Coventry Road. Commercial buildings are located on and adjacent to Site 5. Site 44 is present adjacent to Melbicks Garden & Leisure centre. Sites 11, 16, 23, 34, 38, 41, 44 and 54 are located within a sand and gravel MSA (although at many of these sites the sand and gravel resource has already been removed).
Post-construction development	
Jacksons Brickworks Landfill (Site ID 1), historical landfill, class 3. The Proposed Scheme crosses the north-eastern corner of the site. This section requires a significant cutting (approximately 7m to 9m in cut within Diddington cutting) to allow the Proposed Scheme to pass under the A45 Coventry Road.	
Infilled pond (Site ID 2), class 2. The site is partially located under the current East Way. No works are proposed at the location of the site.	
Windbridge Nurseries Landfill (Site ID 5), class 2. The site is adjacent to possible signalling works on the Rugby to Birmingham line. No below ground excavation works within the landfill boundary are proposed.	
Infilled pit (Site ID 11), class 2. The site is located on the edge of the Proposed Scheme railway (in Diddington cutting). A balancing pond is proposed to the north of the site.	
Backfilled borrow pit (Site ID 16), class 1. No new railway or road infrastructure on or adjacent to site. Land to be used for temporary housing for construction workers and temporary stockpile areas.	
Infilled sand and gravel quarry (Site ID 23), class 2. A balancing pond and access road are proposed at the site.	
Backfilled borrow pit (Site ID 34), class 2. New car parking and road infrastructure associated with the Birmingham Interchange station proposed over the site. A balancing pond is to be located in the north of the site and the north-west	

of the site is to be used for temporary workers accommodation satellite compound.

Middle Bickenhill Lane Landfill (Site ID 38), historical landfill, class 3. Proposed Scheme to pass through the landfill in approximately 2m to 3m of cutting (Bickenhill cutting). Road infrastructure works are proposed either side of the route. An existing ditch in the north of the site is to be re-graded and lowered.

Infilled pits (Site IDs 39 and 40), class 2. Site 39 is located on the line of works to the A452 Southbound on link (at grade). Electrical utility diversion works are proposed through Site 40.

Packington Landfill (Site ID 41), class 3. The south-western edge of the landfill is located adjacent to works to the A452 southbound on link including a new drainage ditch adjacent to the site. Works to overhead electricity cables are proposed in the south-west of the site. No below ground excavation works are proposed within the landfill boundary.

Brackenlands Farm Landfill (Site ID 44), historical landfill, class 3. The current A452 Chester Road/A446 Stonebridge Road roundabout to the north-west of the site is to be demolished and new access roads constructed (at grade) adjacent to the landfill, but not within the landfill boundary. A new electrical cable is proposed adjacent to the access road in the middle of the site which may require excavation into the landfill. New overhead electrical cables are proposed to the west of the landfill.

Coleshill Civic Amenity Site Landfill (Site ID 54), historical landfill, class 3. A new balancing pond, drainage channel and access road are proposed adjacent to the southern boundary of Site 54. Works are proposed in a very small portion of the site to connect the new drainage channel to an existing surface drainage channel.

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Table 4: Baseline CSM and qualitative risk assessment for Group A sites

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Soil, leachate, ground gas and groundwater contamination from historical landfills and infilled pits and ponds. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH, fuels.	On-site users - current	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Low	Medium	Moderate/low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Low	Medium	Moderate/low risk
		Inhalation of ground gases	Low	Severe	Moderate risk
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours with contaminated soils	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Medium	Low risk
		Inhalation of ground gases	Low to likely (Sites 1, 2, 16 and 44 have housing receptors nearby and no known gas control measures)	Severe	Moderate risk to high risk
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours with contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours with contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	Low to likely (Sites 1, 2, 16 and 44 have housing receptors nearby and no known gas control measures)	Severe	Moderate risk to high risk

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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Soil, leachate, ground gas and groundwater contamination from historical landfills and infilled pits and ponds.	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Likely (historical landfills and pits unlikely to have control measures in place)	Minor to medium (minor for infilled pits, possibly medium for large landfills dependent on waste)	Moderate/low risk to moderate risk
Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH, fuels.	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Likely	Minor to medium (dependent on waste type)	Moderate/low risk to moderate risk
	Property receptors – buildings, foundations and services (on-site and on-site)	Exposure to explosive gases	Low to likely (Sites 1, 2, 16 and 44 have housing receptors nearby and no known gas control measures)	Severe	Moderate risk to high risk
		Direct contact with contaminated soils and waters	Low	Minor	Low risk
	Ecological / geological designations	Vertical and lateral migration, direct contact	Likely (Site 54 only)	Medium	Moderate risk
Notes / assumptions Sites assessed without construction of the Proposed Scheme. A range may be given as the type and concentration of contaminants present at the sites is unknown.					

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Table 5: Construction CSM and qualitative risk assessment for Group A sites

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Soil, leachate, ground gas and groundwater contamination from historical landfills and infilled pits and ponds. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH, fuels.	On-site users - current	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Low to likely	Medium	Moderate/low risk to moderate risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Low to likely	Medium	Moderate/low risk to moderate risk
		Inhalation of ground gases	Low	Severe	Moderate risk
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Medium	Low risk
		Inhalation of ground gases	Low to likely (Sites 1, 2, 16 and 44 have housing receptors nearby and no known gas control measures)	Severe	Moderate risk to high risk
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours with contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours with contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	Low to likely (Sites 1, 2, 16 and 44 have housing receptors nearby and no known gas control measures)	Severe	Moderate risk to high risk

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Soil, leachate, ground gas and groundwater contamination from historical landfills and infilled pits and ponds. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH, fuels.	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Likely (assuming not all of the landfill material is removed during construction)	Minor to medium (minor for infilled pits, possibly medium for large landfills dependent on waste)	Moderate/low risk to moderate risk
	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Likely	Minor to medium (dependent on waste type)	Moderate/low risk to moderate risk
	Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases	Low to likely (Sites 1, 2, 16 and 44 have housing receptors nearby and no known gas control measures)	Severe	Moderate risk to high risk
		Direct contact with contaminated soils and waters	Low	Minor	Low risk
	Ecological / geological designations	Vertical and lateral migration, direct contact	Likely (Site 54 only)	Medium	Moderate risk
Notes / assumptions During construction standard mitigation procedures are assumed to be implemented in accordance with the CoCP. Construction workers have been excluded from assessment due to the use of PPE / risk management. Whilst the CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the CoCP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline. Ground investigation will be required prior to construction. Assumes construction phase includes remediation that may be required.					

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Table 6: Post-construction CSM and qualitative risk assessment for Group A sites

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Residual soil, leachate, ground gas and groundwater contamination.	On-site users - future	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	Unlikely to low (assuming that remedial control measures can be retrofitted)	Severe	Moderate/low risk to moderate risk
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	Unlikely to low (assuming that remedial control measures can be retrofitted)	Severe	Moderate/low risk to moderate risk
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours with contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours with contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	Unlikely to low (assuming that remedial control measures can be retrofitted)	Severe	Moderate/low risk to moderate risk
Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely to likely (assuming that remedial control measures can be retrofitted)	Minor (assuming some of the waste has been removed at each site, the volumes of leachate have reduced and/or been controlled)	Very low risk to moderate/low risk	

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Residual soil, leachate, ground gas and groundwater contamination.	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Unlikely to likely (assuming that remedial control measures can be retrofitted)	Minor (assuming some of the waste has been removed at each site, the volumes of leachate have reduced and/or been controlled)	Very low risk to moderate/low risk
	Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases	Unlikely to low (assuming that some gas control measures can be installed)	Severe	Moderate/low risk to moderate risk
		Direct contact with contaminated soils and waters	Unlikely	Minor	Very low risk
	Ecological / geological designations	Vertical and lateral migration, direct contact	Likely (Site 54 only) ⁶	Medium ⁶	Moderate risk
Notes / assumptions					
Assumes remediation required has been undertaken and construction works are complete.					
'On-site users' excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction.					
A range may be given as remediation strategies will vary in design to focus on specific contaminative risks at each site. Remediation strategies may involve source removal or pathway intervention as appropriate. For example Site 38 is likely to require more remediation than Site 44 as new structures associated with the Proposed Scheme cover the whole of Site 38, whereas only part of Site 44 will be impacted by the Proposed Scheme and consequently the probability and consequence is likely to reduce from the baseline assessment to a greater extent at Site 38 compared to Site 44.					

⁶ A new balancing pond, drainage channel and access road are proposed on the southern edge of the Coleshill Civic Amenity Site Landfill (Site 54) with intrusive works likely to be negligible within the landfill boundary. Consequently, the majority of the landfill is unlikely to be remediated and the probability and consequence is unlikely to change from baseline.

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Table 7: Significance of impact during construction and post-construction for Group A sites

Contaminant linkage	Baseline	Construction	Post-construction	Construction impact	Post-construction impact
	Risk	Risk	Risk	Significance	Significance
Exposure to soil contamination – human health (on-site)	Moderate/low risk	Moderate/low risk to moderate risk	Very low risk	Negligible to Minor adverse	Moderate beneficial
Exposure to groundwater contamination – human health (on-site)	Moderate/low risk	Moderate/low risk to moderate risk	Very low risk	Negligible to Minor adverse	Moderate beneficial
Exposure to ground gases - human health (on-site)	Moderate risk	Moderate risk	Moderate/low risk to moderate risk	Negligible	Negligible to minor beneficial
Exposure to soil contamination – human health (off-site - residential)	Low risk	Low risk	Very low risk	Negligible	Minor beneficial
Exposure to groundwater contamination – human health (off-site - residential)	Low risk	Low risk	Very low risk	Negligible	Minor beneficial
Exposure to ground gases - human health (off-site - residential)	Moderate risk to high risk	Moderate risk to high risk	Moderate/low risk to moderate risk	Negligible	Minor beneficial
Exposure to soil contamination – human health (off-site - commercial)	Very low risk	Very low risk	Very low risk	Negligible	Negligible
Exposure to groundwater contamination – human health (off-site - commercial)	Very low risk	Very low risk	Very low risk	Negligible	Negligible
Exposure to ground gases - human health (off-site - commercial)	Moderate risk to high risk	Moderate risk to high risk	Moderate/low risk to moderate risk	Negligible	Minor beneficial
Contaminated soil leachate / groundwater and pollution of aquifer	Moderate/low risk to moderate risk	Moderate/low risk to moderate risk	Very low risk to moderate/low risk	Negligible	Minor to moderate beneficial
Contaminated soil leachate / groundwater and impact on surface watercourse	Moderate/low risk to moderate risk	Moderate/low risk to moderate risk	Very low risk to moderate/low risk	Negligible	Minor to moderate beneficial

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Contaminant linkage	Baseline	Construction	Post-construction	Construction impact	Post-construction impact
	Risk	Risk	Risk	Significance	Significance
Impact on property receptors from ground gases	Moderate risk to high risk	Moderate risk to high risk	Moderate/low risk to moderate risk	Negligible	Negligible to minor beneficial
Impact on property receptors from soil contamination and groundwater	Low risk	Low risk	Very low risk	Negligible	Minor beneficial
Impact on ecological receptors from contaminated soil leachate / groundwater (Site 54 only)	Moderate risk	Moderate risk	Moderate risk	Negligible	Negligible
Overall significance				Negligible to minor adverse	Negligible to moderate beneficial
Notes / assumptions	<p>Assumes that remediation has been undertaken and construction works complete.</p> <p>Assumes mitigation during construction for risks to property.</p> <p>A range may be given dependent on whether contamination exists and whether it is removed during construction.</p>				

Detailed risk assessment – Group B

Table 8: Detailed risk assessment for Group B sites in the study area

Site ID (IDS)	3, 4, 9, 12, 13, 32, 36, 37, 43, 46, 58
Community forum area	Birmingham Interchange and Chelmsley Wood
Site group	Group B: Sites within the land required to construct the Proposed Scheme, potentially affected by soil/groundwater contamination only
Site title (Site ID) and land use class⁷	<p>Cottage Farm (Site ID 3), class 1.</p> <p>Dismantled Hampton-in-Arden to Shustoke line (Site ID 4), class 2.</p> <p>Myrtle Cottage Farm and Garage Services (Site ID 9), class 2. A small infilled pond is located within the farm and garage site.</p> <p>Park Farm Quarry (Site ID 12), class 1.</p> <p>Former Smithy (Site ID 13), class 2.</p> <p>Rugby to Birmingham line and Birmingham International station (Site ID 32), class 2, operational.</p> <p>Historic Warren Farm (Site ID 36), class 1.</p> <p>Park Farm (Site ID 37), class 1.</p> <p>Melbicks Garden & Leisure centre (Site ID 43), class 1.</p> <p>Birmingham Business Park (Site ID 46), class 1.</p> <p>Highways Agency Depot (Site ID 58), class 2. Operational.</p>
Receptors	
Sensitive land use e.g. housing, schools, parks, playgrounds (adjacent and/or <50m)	<p>Site 9 is within 50m of residential properties adjacent to Middle Bickenhill Lane.</p> <p>Site 12 is adjacent to Park Farm.</p> <p>Site 43 within 50m of Common Farm.</p>
Aquifer e.g. Secondary A or Principal	<p>Sites 3, 4, 9, 12, 36, 37, 43, 46 and 58 are located above the Glaciofluvial Deposits Secondary A Aquifer. Site 12 is also partly located above the Alluvium Secondary A Aquifer.</p> <p>Site 32 is located above the Arden Sandstone Secondary A Aquifer.</p> <p>Site 13 located within 50m of the Glaciofluvial Deposits Secondary A Aquifer.</p>
Surface watercourses (adjacent and / or <50 m)	<p>Sites 4 and 12 are located adjacent to Hollywell Brook. Hollywell Brook is culverted under Site 32.</p> <p>River Blythe SSSI is approximately 30m east of Site 13.</p>

⁷ As defined by Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2)

Geological or ecological designations e.g. SSSI or RAMSAR	River Blythe SSSI (30m east of Site 13).
Property e.g. mineral resources, buildings and structures, Grade 1 agricultural land	Site 12 (Park Farm Quarry) is an operational quarry extracting sand and gravel from the area designated as a sand and gravel MSA. Site 58 is located within a sand and gravel MSA.
Post-construction development	
<p>Cottage Farm (Site ID 3), class 1. A new access road to the National Motorcycle Museum crosses the site in slight cut.</p> <p>Dismantled Hampton-in-Arden to Shustoke line (Site ID 4), class 2. The Proposed Scheme crosses the dismantled Hampton-in-Arden to Shustoke line roughly at grade. Two new balancing ponds are proposed adjacent to the dismantled Hampton-in-Arden to Shustoke line (in cutting). In addition, the new people mover depot will cut across the dismantled Hampton-in-Arden to Shustoke line and Hollywell Brook culvert is be removed and a new crossing in cut provided across the dismantled Hampton-in-Arden to Shustoke line.</p> <p>Myrtle Cottage Farm and Garage Services (Site ID 9), class 2. Adjacent to works to A45 Coventry Road and utility relocation into new A45 Coventry Road.</p> <p>Park Farm Quarry (Site ID 12), class 1. Cut in Site ID 12 is associated with several works including the Proposed Scheme railway (in the north of the site), a new balancing pond (in the south of the site), the Birmingham Interchange station, new car parking and road infrastructure works associated with the Birmingham Interchange station and utilities diversions.</p> <p>Former Smithy (Site ID 13), class 2. The site is located on the edge of the embankment of the A452 Chester Road. A new drainage channel is proposed through the site.</p> <p>Rugby to Birmingham line and Birmingham International station (Site ID 32), class 2. Operational. The new people mover is to cross the site on viaduct. In addition a people mover stop is proposed to the west of the station.</p> <p>Historic Warren Farm (Site ID 36), class 1. The site is located in an area of new car parking associated with the Birmingham Interchange Station and water and utilities diversions.</p> <p>Park Farm (Site ID 37), class 1. The site is located adjacent to the proposed new Birmingham Interchange station A452 Exit road and Birmingham Interchange east car park link road as well as utility diversion works.</p> <p>Melbicks Garden & Leisure centre (Site ID 43), class 1. A new access road is proposed to the west of the site and new utilities are proposed in the south-east of the site.</p> <p>Birmingham Business Park (Site ID 46), class 1. Adjacent to the proposed A452 Chester Road and Solihull Parkway roundabout and utility diversions along the new road alignments.</p> <p>Highways Agency Depot (Site ID 58), class 2. Widening of entry lanes around M6 junction 4 is proposed to the south-east of the site.</p>	

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Table 9: Baseline CSM and qualitative risk assessment for Group B sites

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Soil, leachate and groundwater contamination from railways, farms, a garage, historical smithy, a nursery, Birmingham Business Park and a depot. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, fuels, pesticides and fertilisers (farm and nursery use), asbestos and PAH.	On-site users - current	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor to medium	Very low risk to low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor to medium	Very low risk to low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor to medium	Very low risk to low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor to medium	Very low risk to low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	N/A	N/A	N/A

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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Soil, leachate and groundwater contamination from railways, farms, a garage, historical smithy, a nursery, Birmingham Business Park and a depot. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, fuels, pesticides and fertilisers (farm and nursery use), asbestos and PAH.	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Low to likely ⁸	Minor (most sites are class 1 or 2)	Low risk to moderate/low risk
	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Low to likely (sites located close to surface waters only)	Minor	Low risk to moderate/low risk
	Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases	N/A	N/A	N/A
		Direct contact with contaminated soils and waters	Low	Minor	Low risk
	Ecological / geological designations	Vertical and lateral migration, direct contact	Low (relates to Site 13 only)	Minor	Low risk
Notes / assumptions Sites assessed without construction of the Proposed Scheme. N/A is not applicable, due to grouping assumption that Group B sites are not affected by ground gas. A range may be given as the type and concentration of contaminants present at the sites is unknown.					

⁸ All but one of the Group B sites are on or adjacent to a shallow Secondary A Aquifer and therefore if a contamination source is present there is likely to be a pathway to groundwater however, a source may not be present at all sites as most have a low land classification of class 1 or 2.

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Table 10: Construction CSM and qualitative risk assessment for Group B sites

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Soil, leachate and groundwater contamination from railways, farms, a garage, historical smithy, a nursery, Birmingham Business Park and a depot. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, fuels, pesticides and fertilisers (farm and nursery use), asbestos and PAH.	On-site users - current (on-site users may not be present at all sites)	Direct contact, ingestion, inhalation of dusts and vapours with contaminated soils	Unlikely	Minor to medium	Very low risk to low risk
		Direct contact, ingestion, inhalation of vapours with contaminated waters	Unlikely	Minor to medium	Very low risk to low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor to medium	Very low risk to low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor to medium	Very low risk to low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours with contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours with contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	N/A	N/A	N/A

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Soil, leachate and groundwater contamination from railways, farms, a garage, historical smithy, a nursery, Birmingham Business Park and a depot. Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, fuels, pesticides and fertilisers (farm and nursery use), asbestos and PAH.	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Low to likely ⁹	Minor (most sites are class 1 or 2)	Low risk to moderate/low risk
	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Low to likely (sites located close to surface waters only)	Minor	Low risk to moderate/low risk
	Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases	N/A	N/A	N/A
		Direct contact with contaminated soils and waters	Low	Minor	Low risk
	Ecological / geological designations	Vertical and lateral migration, direct contact	Low (relates to Site 13 only)	Minor	Low risk
Notes / assumptions During construction standard mitigation procedures are assumed to be implemented in accordance with the CoCP. Construction workers have been excluded from assessment due to the use of PPE / risk management. Whilst the CoCP will make it unlikely that there will be adverse consequences, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the CoCP generally results in a low or unlikely probability, but in some cases the consequence may temporarily increase from that defined at baseline. N/A is not applicable, due to grouping assumption that Group B sites are not affected by ground gas. Ground investigation will be required prior to construction. Assumes construction phase includes remediation that may be required.					

⁹ All but one of the Group B sites are on or adjacent to a shallow Secondary A Aquifer and therefore if a contamination source is present there is likely to be a pathway to groundwater however, a source may not be present at all sites as most have a low land classification of class 1 or 2

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Table 11: Post-construction CSM and qualitative risk assessment for Group B sites

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Residual soil, leachate and groundwater contamination	On-site users – future	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor (assumes removal of any contaminated material encountered)	Very low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor (assumes removal of any contaminated material encountered)	Very low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours from contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapours with contaminated waters	Unlikely	Minor	Very low risk
		Inhalation of ground gases	N/A	N/A	N/A
	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Low to likely (dependent on whether contamination sources are wholly removed during the works)	Minor	Low risk to moderate/low risk

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Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Residual soil, leachate and groundwater contamination	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Low to likely (dependent on whether contamination sources are removed during the works)	Minor	Low risk to moderate/low risk
	Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases	N/A	N/A	N/A
		Direct contact with contaminated soils and waters	Unlikely	Minor	Very low risk
	Ecological / geological designations	Vertical and lateral migration, direct contact	Unlikely (assuming contamination at Site 13 is removed/ remediated)	Minor	Very low risk
Notes / assumptions					
Assumes remediation required has been undertaken and construction works are complete.					
N/A is not applicable, due to grouping assumption that Group B sites are not affected by ground gas.					
'On-site users' excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction.					
A range may be given as remediation strategies will vary in design to focus on specific contaminative risks at each site. Remediation strategies may involve source removal or pathway intervention as appropriate.					

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Table 12: Significance of impact during construction and post-construction for Group B sites

Contaminant linkage	Baseline	Construction	Post-construction	Construction impact	Post-construction impact
	Risk	Risk	Risk	Significance	Significance
Exposure to soil contamination – human health (on-site)	Very low risk to low risk	Very low risk to low risk	Very low risk	Negligible	Negligible to minor beneficial
Exposure to groundwater contamination – human health (on-site)	Very low risk to low risk	Very low risk to low risk	Very low risk	Negligible	Negligible to minor beneficial
Exposure to ground gases - human health (on-site)	N/A	N/A	N/A	N/A	N/A
Exposure to soil contamination – human health (off-site - residential)	Very low risk to low risk	Very low risk to low risk	Very low risk	Negligible	Negligible to minor beneficial
Exposure to groundwater contamination – human health (off-site - residential)	Very low risk to low risk	Very low risk to low risk	Very low risk	Negligible	Negligible to minor beneficial
Exposure to ground gases - human health (off-site - residential)	N/A	N/A	N/A	N/A	N/A
Exposure to soil contamination – human health (off-site - commercial)	Very low risk	Very low risk	Very low risk	Negligible	Negligible
Exposure to groundwater contamination – human health (off-site - commercial)	Very low risk	Very low risk	Very low risk	Negligible	Negligible
Exposure to ground gases - human health (off-site - commercial)	N/A	N/A	N/A	N/A	N/A
Contaminated soil leachate / groundwater and pollution of aquifer	Low risk to moderate/low risk	Low risk to moderate/low risk	Low risk to moderate/low risk	Negligible	Negligible
Contaminated soil leachate / groundwater and impact on surface watercourse	Low risk to moderate/low risk	Low risk to moderate/low risk	Low risk to moderate/low risk	Negligible	Negligible
Impact on property receptors from ground	N/A	N/A	N/A	N/A	N/A

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Contaminant linkage	Baseline	Construction	Post-construction	Construction impact	Post-construction impact
	Risk	Risk	Risk	Significance	Significance
gases					
Impact on property receptors from soil contamination and groundwater	Low risk	Low risk	Very low risk	Negligible	Minor beneficial
Contaminated soil leachate / groundwater and impact on ecological designations (Site 13 only)	Low risk	Low risk	Very low risk	Negligible	Minor beneficial
Overall significance				Negligible	Negligible to minor beneficial
Notes / assumptions					
Assumes that remediation has been undertaken and construction works complete.					
N/A is not applicable, due to grouping assumption that Group B sites are not affected by ground gas.					
A range may be given dependent on whether contamination exists and whether it is removed during construction					

Detailed risk assessment – Group C

Table 13: Detailed risk assessment for Group C sites in the study area

Site ID (IDS)	56
Community forum area	Birmingham Interchange and Chelmsley Wood.
Site group	Group C: Sites outside of the land required to construct the Proposed Scheme, potentially affected by soil, groundwater and gas contamination.
Site title (Site ID) and land use class¹⁰	Infilled gravel pit (Site ID 56), class 2, unknown fill material.
Receptors	
Sensitive land use e.g. housing, schools, parks, playgrounds (adjacent and/or <50m)	N/A
Aquifer e.g. Secondary A or Principal	The site is located above the Glaciofluvial Deposits (sand and gravel) Secondary A Aquifer, however at least part of this aquifer has been quarried at this location.
Surface watercourses (adjacent and/or <50 m)	N/A
Geological or ecological designations e.g. SSSI or RAMSAR	N/A
Property e.g. mineral resources, buildings and structures, Grade 1 agricultural land	The site is located within a sand and gravel MSA however the site has already been quarried. No building receptors are located nearby.
Post-construction development	
Infilled gravel pit (Site ID 56), class 2. Entry lane widening works to M6 junction 4 are located to the north-east of the site.	

¹⁰ As defined by Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2)

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Table 14: Baseline CSM and qualitative risk assessment for Group C sites

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Soil, leachate, ground gas and groundwater contamination at an infilled gravel pit (Site 56). Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH.	On-site users – current	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Minor	Moderate/low risk
	Controlled waters - surface water	Lateral migration through groundwater	Likely	Minor	Moderate/low risk

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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Property receptors – buildings, foundations and services (on-site and off-site)		Direct run-off from site			
	Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases	N/A	N/A	N/A
		Direct contact with contaminated soils and waters	N/A	N/A	N/A

Notes / assumptions
 Sites assessed without construction of the Proposed Scheme.
 N/A is not applicable, due to the lack of human health or building receptors on or surrounding the site.
 'On-site' and 'off-site' here refer to site users being situated within or adjacent to the potentially contaminated sites being assessed.
 A range may be given as the type and concentration of contaminants present at the sites is unknown.

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Table 15: Construction CSM and qualitative risk assessment for Group C sites

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Soil, leachate, ground gas and groundwater contamination at an infilled gravel pit (Site 56). Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH.	On-site users – current	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Minor	Moderate/low risk
	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Likely	Minor	Moderate/low risk

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Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Property receptors – buildings, foundations and services (on-site and off-site) - Site 41 only, Site 56 has no receptors close by	Exposure to explosive gases	N/A	N/A	N/A	N/A
	Direct contact with contaminated soils and waters	N/A	N/A	N/A	N/A
Notes / assumptions					
'On-site' and 'off-site' here refer to site users being situated within or adjacent to the potentially contaminated sites being assessed.					
N/A is not applicable, due to the lack of human health or building receptors on or surrounding the site.					
Sites within this CSM group are located outside of the land required to construct the Proposed Scheme and represent off-site potential sources of contamination. Due to the absence of remediation targeting these sites, the source at construction will remain the same as at baseline.					

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Table 16: Post-construction CSM and qualitative risk assessment for Group C sites

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Soil, leachate, ground gas and groundwater contamination at an infilled gravel pit (Site 56). Potential for a range of organic and inorganic contaminants including but not limited to: Heavy metals, ammonia, asbestos, ground gases (methane, carbon dioxide) and organics such as PAH.	On-site users – current	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - residential	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours from contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Off-site users - commercial	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils	N/A	N/A	N/A
		Direct contact, ingestion, inhalation of vapours with contaminated waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Controlled waters - groundwater	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Minor	Moderate/low risk
	Controlled waters - surface water	Lateral migration through groundwater Direct run-off from site	Likely	Minor	Moderate/low risk

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Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation	
Property receptors – buildings, foundations and services (on-site and off-site)	Exposure to explosive gases Direct contact with contaminated soils and waters	N/A	N/A	N/A	N/A	
		N/A	N/A	N/A	N/A	
Notes / assumptions						
'On-site' and 'off-site' here refer to site users being situated within or adjacent to the potentially contaminated sites being assessed.						
N/A is not applicable, due to the lack of human health or building receptors on or surrounding the site.						
Sites within this CSM group are located outside of the land required to construct the Proposed Scheme and represent off-site potential sources of contamination. Due to the absence of remediation targeting these sites, the source at post-construction will remain the same as at baseline.						

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Table 17: Significance of impact during construction and post-construction for Group C sites

Contaminant linkage	Baseline	Construction	Post-construction	Construction impact	Post-construction impact
	Risk	Risk	Risk	Significance	Significance
Contaminated soil leachate / groundwater and pollution of aquifer	Moderate/low risk	Moderate/low risk	Moderate/low risk	Negligible	Negligible
Contaminated soil leachate / groundwater and impact on surface watercourse	Moderate/low risk	Moderate/low risk	Moderate/low risk	Negligible	Negligible
Overall significance				Negligible	Negligible

Detailed risk assessment – Group D

Table 18: Detailed risk assessment for Group D sites in the study area

Site ID (IDS)	No sites identified within Group D
Community forum area	Birmingham Interchange and Chelmsley Wood.
Site group	Group D: Sites outside of the land required to construct the Proposed Scheme, potentially affected by soil/groundwater contamination only.
Site title (Site ID) and land use class¹¹	N/A
Receptors	
Sensitive land use e.g. housing, schools, parks, playgrounds (adjacent and/or <50m)	N/A
Aquifer e.g. Secondary A or Principal	N/A
Surface watercourses (adjacent and/or <50 m)	N/A
Geological or ecological designations e.g. SSSI or RAMSAR	N/A
Property e.g. mineral resources, buildings and structures, Grade 1 agricultural land	N/A
Post-construction development	
N/A	

¹¹ As defined by Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2)

4 Inspections notes and other site data

4.1.1 This section presents the following data:

- site inspection notes for those key potentially contaminated sites visited during the study period;
- names of ground investigation or contamination survey reports reviewed during the study period; and
- any other relevant site data.

4.1.2 Table 19 details the site inspection notes from visits made to sites. The site inspection notes are then included.

Table 19: Site inspection notes

Date	Site
23 November 2012	National Stadium report review
9 November 2012	Packington Landfill site visit

**HS2 WEST MIDLANDS – LAND QUALITY
REPORT REVIEW PRO FORMA**

REPORT TITLE:	National Stadium – Environmental Statement (read ground conditions and contamination chapter and water resources chapter)		
SITE LOCATION:	Within triangle of land between M42, A452 Chester Road and A45 Coventry Road		
DATE PREPARED	November 2001	DATE REVIEWED	23 November 2012
AUTHORED BY:	Land quality project team	REVIEWED BY:	Land quality project team
REPORT CONTEXT			
Environmental Statement to support proposed National Stadium.			
SCOPE OF REPORT			
Baseline data collection included a ground investigation (16 trial pits and chemical testing of 18 soil samples). Significant made ground deposits identified as a consequence of construction of M42 and backfilling of smaller pits/excavations.			
CONCLUSIONS			
<p>Soil testing results did not identify any significant contamination.</p> <p>Made ground material with various anthropogenic material encountered in the backfilled borrow pit. One trial pit was located within Middle Bickenhill Lane Landfill and identified landfill material to >4.1mbgl.</p> <p>Water resources section records several abstractions including one at a Farm in the north of the site but this data is from 2001 (and not included in the recent 2012 Envirocheck data).</p> <p>Elevated ground gas identified in some of the boreholes.</p>			
POTENTIAL FOR LAND QUALITY ISSUES AT THE SITE	Low to high (large site with differing site history).		

**HS2 WEST MIDLANDS – LAND QUALITY
SITE INSPECTION PRO FORMA**

PROJECT	HS2		
SITE ADDRESS	Packington Landfill, Packington Lane, Little Packington, Meriden, Warwickshire, CV7 7HN		
PROJECT REFERENCE	Land quality meeting with SITA UK	DATE	09 November 2012
PREPARED BY	Land Quality Project Team	NGR	420850 285100
WEATHER	Overcast, cool, calm		

OVERVIEW SITE DESCRIPTION	
Active landfill site and ancillary waste operations including anaerobic digestion plant, composter, wood shredder, leachate treatment plant, landfill gas plant and polytunnels. Anticipated active for 1.5 years more. Approximately 10 years of restoration once landfilling complete. Area to be restored to a country park.	
Site walkover not conducted, visit undertaken by a driven tour with SITA UK representative. Meeting with SITA UK conducted.	

TOPOGRAPHY	
Not seen.	

SURROUNDING LAND USE (from map)	
NORTH	Fields and M6
NORTHEAST	M6 junction 4 and Pool Wood
EAST	Fields
SOUTHEAST	Fields
SOUTH	Fields
SOUTHWEST	Fields, M42
NORTHWEST	Coleshill and Bannerly Pools SSSI, fields
GENERAL	

VISUAL OR ANECDOTAL EVIDENCE OF CONTAMINATION	
None seen.	

BUILDINGS AND LARGE INFRASTRUCTURE	
From map provided:	
Leachate treatment plant, landfill gas flares, polytunnels, main offices, wood shredder and various other buildings to the north-east.	
Composting facility and weighbridge to the north-west.	

VEGETATION COVER	
Not seen (site walkover not conducted).	
Landfill operation for further 1.5 years (until approximately 2014) then proposed to be restored to a country park.	

ECOLOGICAL ISSUES
Known to contain great crested newts. No badgers. Ecological survey to be carried out by ecology team.
SOIL QUALITY
Not seen.
SITE DRAINAGE
Not seen. From plan provided site includes multiple drainage channels and several surface water lagoons – known to contain great crested newts.
WATER QUALITY
Not seen.
ANCILLIARY INFRASTRUCTURE
Not seen.
SITE OPERATION (PAST AND PRESENT)
Landfill site and associated waste operations including: <ul style="list-style-type: none">• wood shredding;• anaerobic digestion;• leachate treatment;• green waste composting; and• landfill gas plant.

- 4.1.3 Other relevant site data that has been reviewed is detailed in Table 20 below. These documents are appended to this report.

Table 20: Other relevant site data

Site	Document description	No. pages
Jacksons Brickworks Landfill	The waste disposal licence, Waste Regulatory Authority inspection notes and certificate of completion for Jacksons Brickworks Landfill	36
Middle Bickenhill Lane Landfill	The waste disposal licence and the SMBC and Environment Agency database records	9
Brackenlands Farm Landfill	The SMBC and Environment Agency database records, a Department of the Environment and Transport report (1986), a Severn Trent Water letter dated 12 September 1984, a report of Director of Environmental Health and trading Standards dated 28 November 1991 and a report detailing testing undertaken on soils and grasses at Brackenlands Farm dated 7 August 1991	18
Windbridge Nurseries Landfill	Environment Agency database records	1
Packington Landfill	Planning consent master plan, April 2011	1
Coleshill Civic Amenity Site Landfill	Environment Agency database records	1

- 4.1.4 Information received from SMBC Spatial Planning Department detailing mineral/landfill sites within their area is included in Table 21.

Table 21: Information on mineral and landfill sites from SMBC Spatial Planning Department

Location	Information
Former Arden Brickworks Site, A45 Coventry Road, Bickenhill	Owner/operator – Eaglebeam Ltd (formerly McLean Estates) Former brickworks and clay extraction site. No active extraction or infilling for many years, but extant minerals consents (subject to ROMP review in 2014) brought together under ROMP (Review of old mineral permissions) unified set of conditions in 1997 (ref 97/416). Large existing void to be infilled, subject to discharge of conditions. Capacity is unknown. Note – a material recycling facility (MRF) operates here (Armac).
Park Farm (now named Stonebridge Quarry), Land at Middle Bickenhill off A45 Coventry Road	Proposed new sand and gravel extraction operation on the site of the proposed Birmingham Interchange station. Owner/operator – Packington Estates. Planning permission ref 2011/1959 approved in June 2012 and about to be commenced on-site. Estimated six years mineral extraction followed by six years infilling and restoration. 15 year time limit for mineral extraction – 17 years for landfill. Approximately 1.6 million tonnes.

5 Geological SSSI and local geological sites

5.1.1 This section presents the following data:

- citation data for geological SSSI;
- citation data for LGS, formerly called regionally important geological sites (RIGS); and
- any other relevant site data.

5.1.2 The remainder of this section is blank as there are no geological SSSI or LGS within the study area.

6 Mining and minerals data

- 6.1.1 This section presents the following data relating to mining and minerals information:
- details of planning data for minerals sites;
 - lists of marl pits in each study area; and
 - data from The Coal Authority.
- 6.1.2 The remainder of this section presents this data for relevant sites, except that there is no data from The Coal Authority as there are no coal measures within the study area.
- 6.1.3 Table 22 details the data for minerals sites within this study area. These documents are appended to this report.

Table 22: Mining and minerals data

Site	Document details	No. pages
Proposed sand and gravel pit development: Park Farm, Middle Bickenhill, Solihull (now named Stonebridge Quarry)	Greenfield Associates (November 2011): Environmental Statement Appendix - Geological Assessment and Mineral Reserves Assessment Greenfield Associates (December 2011): Planning application: plan PF11-4. proposed site layout and phasing	30 1

- 6.1.4 Table 23 provides details of the marl pits, historical sand and gravel pits (not operational or licensed) and infilled ponds located in or within 250m of this study area.

Table 23: Recorded pits and ponds located in or within 250m of the study area

Type	Location	Mapping on which feature is identified
Partially infilled marl pits	Immediately east of the Proposed Scheme (Site ID 11, Map LQ-01-053, H6, Volume 5, Map Book Land quality).	Ordnance Survey (OS) maps, current maps and British Geological Survey (BGS) database.
	East of the Proposed Scheme (Map LQ-01-053, G6, Volume 5, Map Book Land quality).	
Possible marl pits	West of the Proposed Scheme adjacent to the A45 Coventry Road, the dismantled Hampton-in-Arden to Shustoke line and the East Way (Map LQ-01-053, H7, Volume 5, Map Book Land quality).	1948 aerial photography
	East of the Proposed Scheme in the triangle of land between the A45 Coventry Road, A452 Chester Road and the dismantled Hampton-in-Arden to Shustoke line (Map LQ-01-053, H6, Volume 5, Map Book Land quality).	

Type	Location	Mapping on which feature is identified
	East of the Proposed Scheme in the triangle of land between the A45 Coventry Road A452 Chester Road and the dismantled Hampton-in-Arden to Shustoke line (Map LQ-01-053, G5 Volume 5, Map Book Land quality).	
	Beneath the Proposed Scheme approximately 30m north of the location where the Proposed Scheme crosses the dismantled Hampton-in-Arden to Shustoke line (Map LQ-01-053, G6, Volume 5, Map Book Land quality).	
	Approximately 150m south of Park Farm (Map LQ-01-053, F6, Volume 5, Map Book Land quality).	
	Approximately 100m north of Hollywell Brook and approximately 50m west of the Proposed Scheme (Map LQ-01-053, G5, Volume 5, Map Book Land quality).	1973 aerial photography
Infilled excavation	Beneath the centre line of the Proposed Scheme approximately 80m south of Hollywell Brook (Map LQ-01-053, G6, Volume 5, Map Book Land quality).	1990 aerial photography
Possible pit / excavation	Approximately 30m south-west of the Proposed Scheme to the east of the northern end of Middle Bickenhill Lane (Map LQ-001-053, F6/F7 boundary, Volume 5, Map Book Land quality).	1950 aerial photography
Infilled pond	Under East Way, near Myrtle Cottage Farm, Bickenhill (Site ID 2, Map LQ-001-053, Volume 5, Map Book Land quality).	OS mapping
	West of garage at Middle Bickenhill, north of A45 Coventry Road (Map LQ-01-053, G8, Volume 5, Map Book Land quality).	
	On the western boundary of the A452 Chester Road within Birmingham Business Park (Map LQ-01-054a, H7, Volume 5, Map Book Land quality).	
	On the western boundary of the A452 Chester Road within the northern end of Birmingham Business Park (Map LQ-01-054a, G8, Volume 5, Map Book Land quality).	
	On the western boundary of the A452 Chester Road within the northern end of Birmingham Business Park (Map LQ-01-054a, G8, Volume 5, Map Book Land quality).	
	150m west of the Proposed Scheme, near Brickfield Farm (Map LQ-01-054a, G7, Volume 5, Map Book Land quality).	
	150m west of the Proposed Scheme in Bluebell Recreational Ground (Map LQ-01-054a, F7, Volume 5, Map Book Land quality).	
	150m east of the Proposed Scheme, to the north of the M6, within the M42 junction 7a loop road (Map LQ-01-054a, F7, Volume 5, Map Book Land quality).	
Infilled marl pit	Within Chelmsley Wood residential area, to the north of Birmingham Business Park (Map LQ-01-054a, D8, Volume 5, Map Book Land quality).	OS mapping

Appendix LQ-001-024

Type	Location	Mapping on which feature is identified
Infilled well	Adjacent to the centre line of the Proposed Scheme to the east of Brickfield Farm (Map LQ-01-054a, F6, Volume 5, Map Book Land quality).	OS mapping
Infilled gravel pit	Approximately 150m east of the Proposed Scheme, adjacent to the south-west of M6 junction 4 (Site ID 56, Map LQ-01-054a, F5 and Map LQ-01-054a, G5, Volume 5, Map Book Land quality).	OS mapping

7 References

Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), 2 February 1971. UN Treaty Series No. 14583. As amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987.

DEFRA and Environment Agency (2002), Potential Contaminants for the Assessment of Land. Environment Agency.

Landfill Data Sheet



ENVIRONMENT
AGENCY

Reference	EAHLD31411
Site Address	Coventry Rd, Brownhill, Birmingham, West Midlands
NGR	420500 282900
Local Authority	
Site Reference	
REGIS No	
BGS No	2272
WRC Ref	
EA WMLR	
First Input	31/12/1966
Last Input	31/03/1972

Licenced	<input type="checkbox"/>	Licence Holder Address	
Licence Holder	<input type="text"/>		
Licence issued	<input type="text"/>	Licence Surrendered	<input type="checkbox"/>
		Site Operator Address	
Site Operator	<input type="text"/> C. Bryant and Son Limited		
		Whitmore Road, Birmingham	

Inert	<input type="text"/>	Special	<input type="text"/>	Gas Control	<input type="text"/>
Industrial	<input type="text"/>	Liquid Sludge	<input type="text"/>	Leachate control	<input type="text"/>
Commercial	<input type="text"/>	Waste unknown	<input type="text"/>		
Household	<input type="text"/>	Exempt	<input type="text"/>		

Additional local Information

It must be understood that the information provided above is based on records and files from various sources and of varying reliability. Consequently the Environment Agency is not able to offer any warranty as to the accuracy or completeness of the information provided, nor can it accept any liability whatsoever for any loss or damage arising from the interpretation and/or use of the information. A site inspection has not been carried out in relation to your request for information.



SCANNED
6/1/2005.

LICENCE NO. SL 355

Sheet 1 of 12

WEST MIDLANDS COUNTY COUNCIL

CONTROL OF POLLUTION ACT 1974

LICENCE TO DISPOSE OF WASTE

The County Council of West Midlands in pursuance of the powers conferred on them by the Control of Pollution Act 1974

hereby licence Packington Estate Enterprises Limited

of Packington Hall, Packington Park, Meriden, Coventry CV 7HF (hereinafter called the "licence holder")

to deposit controlled waste in accordance with conditions specified herein on land at Jacksons (Warwickshire) Brickworks Limited, Coventry Road, Bickenhill, Solihull West Midlands B92 0DZ, which is edged red on the drawing attached to the licence being land occupied by the licence holder

This licence is granted subject to the conditions set out in the schedule hereto

Dated this 3rd day of August 19 82

M. T. Taek

County Waste Disposal Officer

The licence holder's attention is drawn to the notes overleaf



LICENCE NO. SL 355

Sheet 2 of 12

NOTES

These notes are for the general guidance of the licence holder and they do not constitute an authoritative statement of the law.

1. This licence only relates to the requirements in the Control of Pollution Act 1974 for the deposit of controlled waste or the use of plant or equipment subject to the conditions set out in the Schedule and does not constitute a consent required by any other legislation. In particular it is the responsibility of the licence holder to comply with any requirements of the Health and Safety at Work etc. Act 1974; the Radioactive Substances Act 1960, The Town and Country Planning Act, Water Protection and Environmental Health Legislation.
2. If the licence holder ceases to occupy the land specified above, then he may transfer the licence to the new occupier after giving notice to the County Waste Disposal Officer that he proposes to transfer the licence on a day specified in the notice. The County Council has the right to decline to accept the new licence holder.
3. If the licence holder wishes to cancel this licence, he must return it to the County Waste Disposal Officer together with a notice stating that he no longer requires the licence. Cancellation of the licence will not affect any outstanding liability of the licence holder under the conditions of the licence.

Contravention of Licence Conditions

Your attention is drawn to the provisions of Section 3, 9 and 16 of the Control of Pollution Act, 1974 appended hereto.

Section 3

Prohibits under penalty, the depositing of waste or the use of plant or equipment otherwise than in accordance with the terms of a licence. This Section applies to all the conditions contained herein, including any which may be the subject of appeal to the Secretary of State under Section 10 of the Act.

Any deposit which takes place without compliance with all the licence conditions is illegal and will lead to prosecution under this Section.



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Sheet 3 of 12

Section 9

Non compliance with any licence conditions may lead to the revocation of this licence.

Section 16

The licencing authority is empowered to require the removal of any controlled waste deposited in circumstances where any of the conditions contained in this licence are not being complied with.

Penalties under Section 3

A person who contravenes any of the above provisions subject to Sub-Section (4) shall be guilty of an offence and liable on summary conviction to a fine of an amount not exceeding £1,000 or on conviction on indictment to imprisonment for a term not exceeding five years or a fine or both.



LICENCE NO. SL 355

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Schedule of Conditions for Landfill Site at:- Jacksons (Warwickshire) Brickworks Limited, Bickenhill, Solihull, West Midlands B92 0DZ.

1. No deposit of waste shall take place unless, at least one month before commencement of any work on the site, a working plan giving details of the proposed conduct of operations at the site has been submitted to the Waste Disposal Authority, and the Licence Holder shall notify the Waste Disposal Authority of any proposed changes in the actual conduct of operations from the proposals shown in the plan, as altered by any previously notified changes, at least one month before the proposed change is implemented.
2. The types of waste deposited daily at the site shall be household waste and industrial waste of similar character and dry inert innocuous materials (see also 2.9 below).

The daily quantities shall not exceed the following:-

- (i) 1600 tonnes of untreated household and commercial waste.
- (ii) 200 tonnes of baled household and commercial waste.
- (iii) 300 tonnes of incinerator residues.
- (iv) 3,000 tonnes of non-hazardous industrial wastes.
- (v) 500 tonnes of inert and non-flammable substances.
- (vi) 1,200 tonnes of cover material and non-hazardous hardcore from the construction industry. This waste shall not contain asbestos waste.
- (vii) 300 tonnes of mine and quarry waste.
- (viii) Quantities of waste asbestos (J10) by agreement with the Waste Disposal Authority and in compliance with the Asbestosis Research Councils Recommended Code of Practice for the Handling and Disposal of Asbestos Waste Material.



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- (ix) Quantities and types of wastes which contain hazardous quantities or hazardous concentrations of any poisonous, noxious, or polluting substance, or which are subject to the requirements of regulations issued under Section 17 of the Control of Pollution Act 1974 as listed in paragraph 14 of the Waste Disposal Site Licence Application.
- (x) 200 tonnes of pulverized fuel ash.

The disposal of animal carcasses and parts thereof shall not be permitted at the site.

The maximum daily input of all wastes shall not exceed 4,000 tonnes.

The average weekly input to the site (calculated on the basis of any four successive weeks input) shall not exceed 12,000 tonnes.

3. (i) No deposit of waste shall take place until the site access from the A45 Coventry Road has been modified in accordance with the requirements of the Waste Disposal Authority.
 - (ii) No deposit shall take place unless a road has first been provided within the site.
 - (iii) The road shall be constructed of tarmac, concrete or similar materials and shall run from the site entrance to the site control office.
 - (iv) The site road should either be of sufficient width to permit two-way vehicular traffic or be of a one-way type system to ensure the segregation of vehicles using the site from vehicles and equipment associated with the brickworks operations. The road shall be maintained to the reasonable satisfaction of the Waste Disposal Authority.
4. (i) No deposit shall take place until suitable wheel cleaning equipment has been installed at the site.



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- (ii) The licence holder shall ensure that the equipment is of a type which will enable the wheels of vehicles leaving the site to be cleaned so as to prevent deposits of mud, soil or other materials from those wheels from fouling highways in the vicinity of the site and shall ensure that at all times the equipment is used for that purpose and is kept in good working order. The equipment shall be installed on a hard surface constructed of tarmac, concrete or similar materials.
- (iii) All drainage from site roads and the wheel washing equipment shall be contained within the site, or disposed of to the satisfaction of the Waste Disposal Authority.
5. (i) No deposit shall take place until a site control office, of a type and in a location approved by the Waste Disposal Authority has been provided.
(ii) The site control office shall be positioned so that queuing does not occur on the highway although queuing will be permitted within the site.
(iii) The position of the office shall be indicated on the working plan.
6. No deposit shall take place until a site identification board of durable material and finish has been displayed at the site entrance, showing the hours when the site is open and giving the name of the site, the name address and telephone number of the operator and of the Waste Disposal Authority.
7. Tanks used for the storage of liquid shall be bunded and shall be of a type and construction suitable for the liquids they contain and shall be labelled to show their contents.
8. No deposit shall take place until water courses on the site have been diverted, culverted or otherwise protected to the reasonable satisfaction of the Waste Disposal Authority and any discharge shall be with the prior written agreement of the Regional Water Authority.



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9. No deposit shall take place until surface drainage water from surrounding higher land has been diverted from the site to the satisfaction of the Waste Disposal Authority.
10. (i) No deposit of waste shall take place until subsidiary site roads have been provided.
 - (ii) Such roads shall be constructed of stone, hardcore or similar material and shall be not less than four metres wide and constructed to within fifty metres of the working face.

NOTE: A suitable depth of stone would be 300mm preferably overlying a fabric stabilisation mat.
 - (iii) The roads shall be indicated on the working plan and constructed to the entrance of each working bay and shall be maintained to a reasonable standard.
11. (i) No disposal shall take place until measures have been taken near operational areas having regard to wind direction so as to ensure that paper and other materials are contained on the site.
 - (ii) Materials arrested shall be removed and disposed of as necessary to maintain the efficiency and tidiness of the site.
12. No deposit of waste shall take place until lockable gates and fencing have been provided to the reasonable satisfaction of the Waste Disposal Authority and all reasonable precautions shall be taken to prevent unauthorised access to the site.
13. (i) The site shall be adequately manned and supervised during working hours.



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- (ii) The hours of working shall not be more than:-

	<u>From</u>	<u>To</u>
Weekdays	07.00	18.00
Saturdays	07.00	13.00
Sundays and Bank Holidays	NIL	
Total hours/week	61	
except for NEC waste which will be accepted outside these hours		

- (iii) No working shall take place during the hours of darkness until lighting of a type approved by the Waste Disposal Authority has been installed.
- (iv) When satisfactory lighting has been installed, continuous 24 hour working will be permitted, provided that it is maintained to the satisfaction of the Waste Disposal Authority, and provided that the facility is used only for waste arising from the National Exhibition Centre.
- (v) Working shall be permitted on the site between the hours of sunrise and sunset where daylight extends beyond those hours indicated in 13(ii) without the installation of lighting equipment.
14. (i) Waste shall only be deposited in excavated areas of the site where the working and winning of minerals has been completed.
- (ii) Waste shall only be deposited in such areas when it has been demonstrated to the satisfaction of the Waste Disposal Authority that the geological and hydrogeological structures are suitable for such deposit.
15. Solid waste shall be compacted and formed into a layer as soon as possible after deposit and in any event not later than at the end of the day on which the waste is received.
16. The depth of a layer of waste shall not exceed 2.5 metres after initial compaction.



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Sheet 9 of 12

17. The layer of waste shall be formed in one or other of the ways described in Condition 18 below using compaction equipment with a blade or other levelling device.
18. Waste shall either:-
 - (i) be deposited on the surface of the site behind the face and partially compacted by a tractor or other compacting machine before being pushed over the face, or
 - (ii) be deposited on the ground forming the base of the site or on a previous layer in front of the face and shall be formed into a compacted layer by being pushed upwards and driven over by the tractor or other compacting machine.
19. Before covering working faces and flanks shall be compacted to form gradients not steeper than 1 in 3.
20. Untreated putrescible waste shall, subject to the traction needs of vehicles operating at the working face, be covered progressively with suitable non-putrescible or stabilised material throughout the working period each day, so that by the end of the working day on which the waste was received, all exposed surfaces, including the flanks and faces of the operational layer, shall have been covered to a depth of not less than 150mm.
21. (i) All large articles such as furniture, crates and empty hollow containers likely to cause a void, shall be crushed, broken up or flattened, and buried by other wastes in such a position that they are not within one metre of the surface or two metres of the flanks or face of the operational layer.
(ii) Where a separate area is allocated for the disposal of such bulky waste, the waste shall be crushed, broken up or flattened and buried with other appropriate wastes.
22. Waste material shall not be deposited into water.



LICENCE NO. SL 355

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23. As required, but not less frequently than once a week, any loose waste which may be lying on the site shall be gathered and disposed of in such a way as to keep the site and surrounding area tidy.
24. (i) No waste material of any sort shall be burnt within the boundaries of the site and a fire at the site shall be regarded as an emergency and immediate action shall be taken to extinguish it.
(ii) All outbreaks of fire shall be notified forthwith to the Fire Service and the Waste Disposal Authority.
25. (i) All necessary precautions shall be taken to destroy and prevent the occurrence of any vermin and insects on the site.
(ii) An insect spraying schedule shall be instigated, when necessary, with particular regard to conditions which may promote the breeding of flying insects and a record shall be kept of such treatments. All pesticides, pesticidal products and, where appropriate, pest control techniques shall have been cleared for their intended use through the Pesticides Safety Precautions Scheme, viz DOE Circular 1976 dated 24th September 1976.
26. A record shall be kept of the types and quantities of the waste deposited and these shall be supplied to the Waste Disposal Authority on request but at a frequency not to exceed once per month.
27. The terms of the site licence shall be made known to every person who is given responsibility for the management or control of the site and a copy of this shall be displayed at the site control office,
28. Site roads shall, in dry weather, be sprayed with water to suppress dust.
29. Before any deposit of pulverised fuel ash takes place at the site, water sprays shall be provided to the reasonable satisfaction of the Waste Disposal Authority and these shall be used when necessary to maintain the waste in a damp condition and so control the emission of dust.



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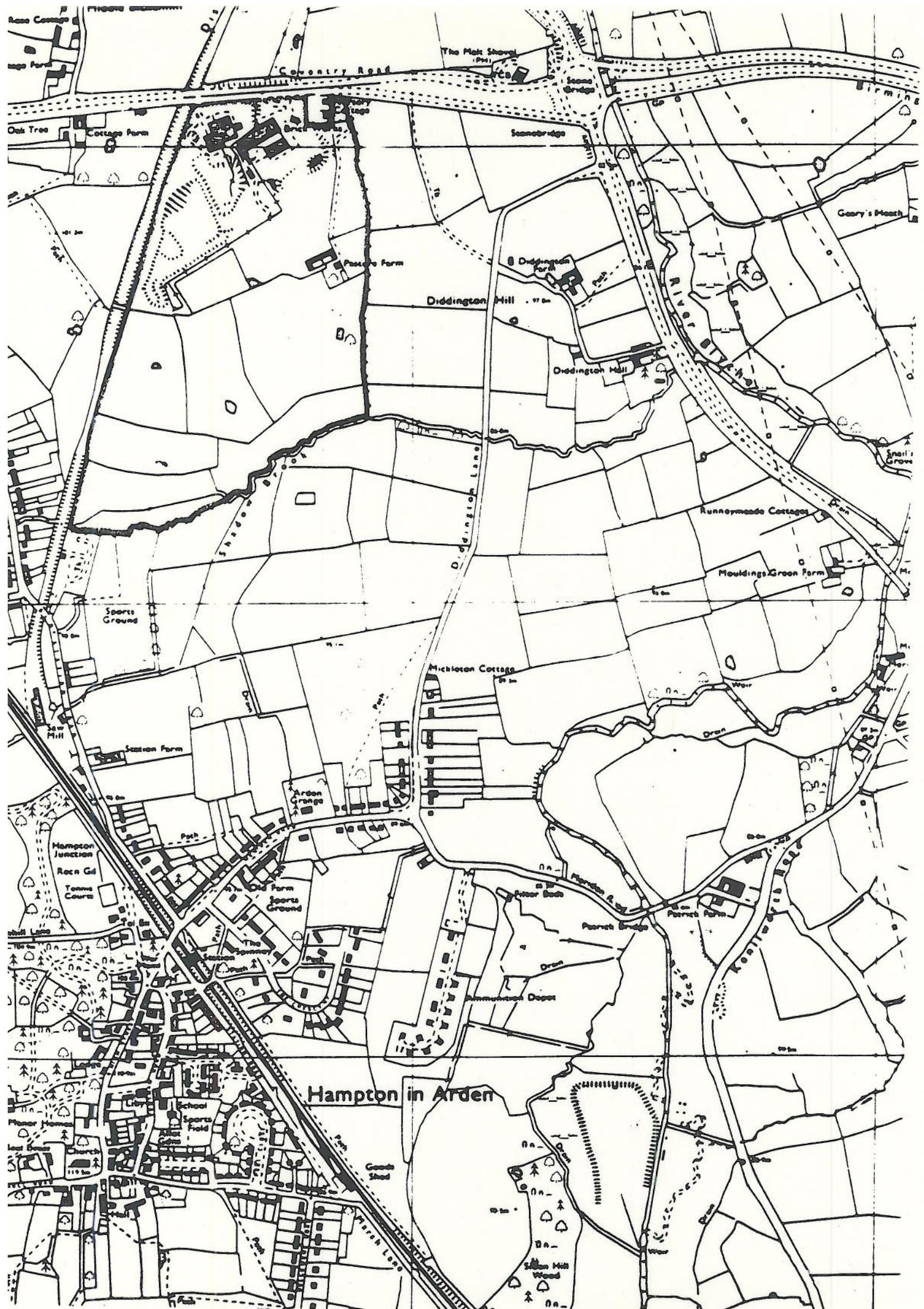
30. Proper provision shall be made for blanketing and binding the surface of completed deposits of pulverised fuel ash and a minimum layer of cover 75mm thick shall be used progressively for this purpose.
31. (i) Deposits of pulverised fuel ash shall be inspected at least once a week to ensure that proper procedures are being followed and that deposit is taking place as provided for in Conditions 29 and 30.
(ii) Records shall be kept of the inspections and shall be available for perusal by the Waste Disposal Authority,
32. Measures to the satisfaction of the Waste Disposal Authority shall be taken to prevent leachate passing from the site.
33. (i) Samples shall be taken from the five monitoring positions shown on the operational working plan at a frequency not less than three times per annum, at or about 4 monthly intervals, and subjected to the following analyses:-
electrical conductivity, pH, total suspended solids, chlorides, ammoniacal nitrogen, chemical oxygen demand, 4 hour permanganate value, total phenols, monohydric phenols, zinc, copper, nickel, lead, chromium and cadmium.
The frequency of sampling and scale of analysis may be increased by the Waste Disposal Authority in consultation with the Severn Trent Water Authority should there be a significant deterioration in the quality of the water samples.
(ii) The cost of maintenance, sampling and analysis shall be borne by the licence holder.
(iii) The results of analysis shall be made available to the Waste Disposal Authority and the Severn Trent Water Authority on request.
34. Any temporary cessation of operations for a period in excess of three months shall be notified to the Waste Disposal Authority.



LICENCE NO. SL 355

Sheet 12 of 12

35. Not less than fourteen days notice shall be given to the Waste Disposal Authority of the date on which landfilling is to commence or recommence in the event of a temporary cessation for a period in excess of three months.
36. Until final restoration, completed areas of landfilling shall be graded and maintained in a tidy condition and, where necessary, action shall be taken to control or destroy weeds.
37. The site shall be restored in accordance with and to the levels specified in the Planning Permission No.3718 dated 5th March, 1952, and in the Planning Permission No.12431 dated 25th April, 1961.
38. On completion of the operations allowed by this licence all plant, machinery and other equipment connected with the disposal of waste shall be removed from the site.
39. Any footpath within or adjacent to the site which is liable to be affected by the operations at the site shall be protected to the reasonable satisfaction of the Waste Disposal Authority.





SCANNED
6/1/2005

CONTROL OF POLLUTION ACT 1974

Section 7

LICENCE NO. SL355
Sheet 1 of 3
Amendment No.1

Notice of Modification of Waste Disposal Licence Condition(s)

To: **Packington Estate Enterprises Limited**
Packington Hall
Packington Park
Meriden
Coventry CV7 7HF

WHEREAS on 3rd August 1982 THE WEST MIDLANDS COUNTY COUNCIL (hereinafter called "the Authority") granted you a Waste Disposal Licence relating to Jacksons (Warwickshire) Brickworks Limited, Coventry Road, Bickenhill, Solihull B92 0DZ subject to the conditions set out therein AND WHEREAS on 10th April 1984 you applied to the Authority to modify the said conditions.

NOTICE is HEREBY GIVEN that the Authority modifies the said conditions as follows:-

Delete condition 6 and add conditions 2(xi), 40, 41, 42, 43, 44, and 45 as specified below;

2(xi) 100 tonnes of scrap tyres for temporary storage prior to shredding.

40 Scrap tyres delivered to the site for temporary storage prior to shredding shall be deposited in an area reserved for such use, on a platform constructed of inert materials.



CONTROL OF POLLUTION ACT 1974

Section 7

**LICENCE NO. SL355
Sheet 2 of 3
Amendment No.1**

- 41 The quantity of scrap tyres stored at the site shall not exceed 7500 tonnes and they shall be retained at the site for no longer than six calendar months prior to shredding.
- 42 Scrap and shredded tyres shall be stored in stacks the dimensions of which shall not exceed the following:-
 - i) 5 metres in height,
 - ii) the height of the quarry lip,
 - iii) 450 cubic metres in capacity,
 - iv) 20 metres in any horizontal direction,
 - v) 235 square metres in any horizontal section.
- 43 An unobstructed access at least 4 metres wide shall be provided and maintained around three sides of each stack or, if the stacks are not rectangular, around three quarters of their perimeter measured continuously.
- 44 Tyres shall not be deposited within the landfill operations at the site unless they have first been shredded.
- 45 No deposit shall take place until a site identification board of durable material and finish has been displayed at the site entrance, showing the hours when the site is open and giving the name of the site, the name, address and telephone number of the operator and of the Waste Disposal Authority and telephone numbers for the relevant local emergency services.

Such modifications shall take effect on 1 October 1984 at 12.00 noon

DATED Tuesday 25

Day of September

1984

(Signed) M. T. Taylor
County Waste Disposal Officer

County Hall
1 Lancaster Circus
Queensway
Birmingham B4 7DJ



CONTROL OF POLLUTION ACT 1974

Section 7

LICENCE NO. SL355
Sheet 3 of 3
Amendment No.1

APPEALS

If a licence holder is aggrieved by the decision of the West Midlands County Council in modifying conditions specified in a disposal licence he may appeal to the Secretary of State in accordance with Section 10 of the Control of Pollution Act 1974. Appeals must be notified within 6 months of the date of this notice to the Secretary, Department of the Environment, Waste Disposal Division, Romney House, 43 Marsham Street, London, SW1P 3PY. The Secretary of State has power to allow a longer period for the giving of notice of an appeal but he will not normally be prepared to exercise this power unless there are special circumstances which excuse the delay in giving notice of an appeal.



OUTGOING-1



OTHER-2

CONTROL OF POLLUTION ACT 1974

Section 7

LICENCE NO SL 355
MODIFICATION NO.2
SHEET 1 OF 3

Notice of modification of Waste Disposal Licence conditions

To: B.F.I. Packington Ltd.,
Packington Hall,
Packington Park,
Meriden,
Coventry,
CV 7HF.

WHEREAS on 3rd August 1982 THE WEST MIDLANDS COUNTY COUNCIL granted a Waste Disposal Licence relating to land at Jacksons (Warwickshire) Brickworks Ltd., Coventry Road, Bickenhill, Solihull subject to the conditions set out therein, and subsequently amended it on 1st October 1984.

NOTICE is HEREBY GIVEN that Solihull Metropolitan Borough Council modifies the said conditions as follows:-
add conditions 46, 47, 48 and 49.

Such modifications shall take effect on

DATED this 5 JAN 1990 DAY OF 19

(Signed) *Bastard*

Head of Environmental Health and
Trading Standards

LI5AAC

ADDITIONAL CONDITIONS FOR LANDFILL SITE AT:-
JACKSONS (WARWICKSHIRE) BRICKWORKS LTD. BICKENHILL

46. Within three months of the date of issue of this modification initial monitoring shall be carried out to establish the concentrations of landfill gas at the site and its immediate environs. The results of monitoring shall be forwarded in writing to the WDA as soon as possible and in any case within one week of the expiry of the above period.
47. The extent of continuing landfill gas monitoring during subsequent tipping operations shall depend, amongst other factors, upon the results of initial monitoring referred to in condition 46. If the WDA so requires within five months of the date of issue of this modification, a scheme for the monitoring and management of landfill gas shall be submitted to the WDA for written approval. The scheme shall give details of:-
 - (a) the location and specification of monitoring boreholes at the site and its immediate environs;
 - (b) the frequency of monitoring;
 - (c) the tests to be carried out during monitoring;
 - (d) the knowledge and experience in gas monitoring of the persons to carry out and supervise the tests;
 - (e) the reporting of results of monitoring to the WDA;
 - (f) measures to be implemented to control the lateral migration and emission of such gases if deemed necessary by the WDA; and
 - (g) any factors likely to influence the monitoring or control of landfill gas.
48. If within six months of the date of issue of this modification a scheme which meets with the approval of the WDA has been required but not submitted, then all tipping shall cease. No further tipping shall take place until a scheme has been submitted to and approved in writing by the WDA.
49. In this licence "landfill gas" means gas having the characteristics of gas produced as a by-product from the digestion by anaerobic bacteria of biodegradable matter present in waste deposited at landfill sites.

Appeals

If a licence holder is aggrieved by the decision of the Authority in modifying conditions specified in a disposal licence he may appeal to the Secretary of State in accordance with Section 10 of the Control of Pollution Act 1974. Appeals must be notified within 6 months of the date of this notice to: The Department of the Environment, (NNW2), Room A2.22, Romney House, 43 Marsham Street, London, SW10 3PY. The Secretary of State has power to allow a longer period for the giving of notice of an appeal but he will not normally be prepared to exercise this power unless there are special circumstances which excuse the delay in giving notice of an appeal.

G

B F I Packington Limited
Packington Hall
Packington Park
Meriden
Coventry

NIGEL BASFORD B.Sc., M.I.E.H., M.I.H.
HEAD OF ENVIRONMENTAL HEALTH
AND TRADING STANDARDS

P.O.Box 24 Council House
Solihull West Midlands B91 3EG
Tel. 021-704 6000

Your ref.

Direct Line 021-704 6826

Our ref. *KMcB* KMcB/ML

Date 24 April 1990

Dear Sir

Jacksons (Warwickshire) Brickworks Limited, Bickenhill
Waste Disposal Licence No. S.L.355

I refer to the results of the survey of landfill gas concentrations carried out at the above site to meet the requirements of Condition 46 of the site licence.

Since landfilling has not yet commenced on this site, the Waste Disposal Authority do not require a scheme for monitoring and control of landfill gas to be submitted at this time. However, the Waste Disposal Authority do require you to submit a scheme for the monitoring and management of landfill gas to that Authority for written approval before landfilling is commenced on the site.

Should you wish to discuss this matter, please contact Mr McBride on the above number.

Yours faithfully

ICK
I C Keagle
Assistant Head of Environmental Health and Trading Standards

WEST MIDLANDS WASTE MANAGEMENT CO-ORDINATING AUTHORITY
HAZARDOUS WASTE UNIT

Name BFI BRICKWORKS.

File 644/144 SL/355.

Address COVENTRY ROAD.
SOLIHULL.

Date 28/9/95.

Time 0830 - 0840

Tel. No.

Weather cloudy

Officer/s Present RSW

Subject Inspection.

Others Present Site Staff.

No extraction or deposits have taken place.
A bit of water in the base..

WEST MIDLANDS WASTE MANAGEMENT CO-ORDINATING AUTHORITY
HAZARDOUS WASTE UNIT

Name BFI BRICKWORKS

File 644/144 SL: 355

Address ARDEN BRICKWORKS,
COVENTRY RD
SOLIHULL

Date 6/7/95

Time 0900

Tel. No.

Weather Sunny

Officer/s Present BN

Subject Inspection

Others Present Staff

No deposits or further excavations have
taken place.

C¹ C²

WEST MIDLANDS WASTE MANAGEMENT CO-ORDINATING AUTHORITY
HAZARDOUS WASTE UNIT

Name BFI

File 6444 144 SL 355,

Address ARDEN BRICKWORKS,
COVENTRY ROAD,
SOLIHULL.

Date 3/11/94

Time 1045 - 1100

Tel. No.

Weather Damp-

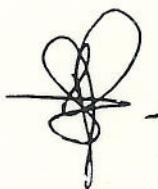
Officer/s Present RSW

Subject inspection

Others Present BFI supervisor

Site not operational.

No mass clay extraction.



WEST MIDLANDS HAZARDOUS WASTE UNIT
SITE REPORT - LANDFILL FACILITY

1. Name R.F.I.
 4. Address ARDEN BRICKWORKS, COVENTRY RD.
 6. Date 11/10/94 & Time 1620 1630
 9. Officer(s) RSW
2. 644/1444 3. SL/3555
 5. District SOUTHALL
 8. Weather Sunny
 10. Other(s) Kevin

	na	ni	1	2	3	4	5	Comments
11. Public Highway	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	■	
12. Entrance / ID	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
13. Primary Road	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	■	
14. Accommodation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
15. Utilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
16. Records	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
17. Weighbridge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
18. Wheelcleaner	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
19. Licence / Working Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	□	□	□	□	□	
20. Secondary Road	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
21. Manning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
22. Security	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	■	
23. Lighting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	□	□	□	□	□	
24. Holding Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
30. Bunds	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
38. Drainage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
39. Leachate	<input type="checkbox"/>	<input checked="" type="checkbox"/>	□	□	□	□	□	
40. Base / Walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>	□	□	□	□	□	
41. Landfill gas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	□	□	□	□	□	
42. Machines and Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
WASTE HANDLING								
43. Compaction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
44. Height / width of face	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
45. Grading	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
46. Cover	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
WASTE TYPES								
47. Difficult	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
48. Biodegradeable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
49. Others	<input checked="" type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
ENVIRONMENTAL IMPACT								
50. Mud	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
51. Dust	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
52. odours	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
54. Litter	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
55. Pests	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
56. Vermin	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
57. Fires	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
58. Noise	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
59. Weeds	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
60. Birds	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
61. Hours	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
62. Tidiness	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	
63. Restored areas	<input type="checkbox"/>	<input type="checkbox"/>	□	□	□	□	□	

64. No. Samples _____

65. No Photographs _____

66. Action Required Date ____/____/____

Additional Comments Overleaf:

Site Not active -

Some extraction has been done.

WEST MIDLANDS HAZARDOUS WASTE UNIT
SITE REPORT - LANDFILL FACILITY

1. Name BFI Arden Brickworks
 2. 644/ 144 3. SL/ 355.
 4. Address Conerty Rd., Bilkenhills
 5. District Solihull
 6. Date 27/09/94 & Time 120 : 130
 7. Officer(s) J. Woodham
 8. Weather Dry, overcast, cool, mild breeze.
 9. Other(s) Kevin (B.F.I. Parkington)

na	ni	1	2	3	4	5	Comments
11. Public Highway	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
12. Entrance / ID	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Entrance tidy. No ID.
13. Primary Road	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
14. Accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15. Utilities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16. Records	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
17. Weighbridge	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
18. Wheelcleaner	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
19. Licence / Working Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Licence ok - No W.P.
20. Secondary Road	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
21. Manning	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
22. Security	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
23. Lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
24. Holding Areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
30. Bunds	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
38. Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	base of quarry being pumped.
39. Leachate	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/D
40. Base / Walls	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ok, no slippages.
41. Landfill gas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	"
42. Machines and Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	clay excavating machinery.
WASTE HANDLING							
43. Compaction	<input checked="" type="checkbox"/>						
44. Height / width of face	<input checked="" type="checkbox"/>						
45. Grading	<input checked="" type="checkbox"/>						
46. Cover	<input checked="" type="checkbox"/>						
WASTE TYPES							
47. Difficult	<input checked="" type="checkbox"/>						
48. Biodegradeable	<input checked="" type="checkbox"/>						
49. Others	<input checked="" type="checkbox"/>	No waste tipped.					
ENVIRONMENTAL IMPACT							
50. Mud	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
51. Dust	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
52. odours	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
54. Litter	<input checked="" type="checkbox"/>						
55. Pests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
56. Vermin	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
57. Fires	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
58. Noise	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
59. Weeds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
60. Birds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
61. Hours	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
62. Tidiness	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
63. Restored areas	<input checked="" type="checkbox"/>						

64. No. Samples _____

65. No Photographs _____

66. Action Required Date ____/____/____

J.H.W.

Additional Comments Overleaf:



BFI PACKINGTON LIMITED

Packington Hall, Packington Park,
Meriden, Coventry, CV7 7HF.
Tel: Meriden (0676) 22155 Fax: Meriden (0676) 22313

BFIP/30/4

SOLIHULL ENVIRONMENTAL HEALTH & TRADING STANDARDS	
1-MAY-1990	
REF. TO	I.C.K.
FILED	SERIALIZED

30th April 1990 → BFI

30th April 1990

Mr. N. Basford,
Head of Environmental Health & Trading Standards,
Solihull Metropolitan Borough Council,
P.O. Box 24,
Council House,
Solihull,
West Midlands, B91 3EG.

For the attention of Mr. I.C. Keagle,
Assistant Head of Environmental Health & Trading Standards.

Dear Mr. Basford,
ARDEN BRICKWORKS LIMITED, BICKENHILL
WASTE DISPOSAL LICENCE NO. SL355

Many thanks for your letter of 24th April 1990 which related to the Landfill Gas Survey that we had carried out at our Arden Brickworks Site.

I am aware that the new condition 46 of our Site Licence requires the preparation of a Landfill Gas Monitoring and Control Scheme prior to tipping. It is most likely that we will not be carrying out the tipping of putrisable material for some many years to come. As you are probably aware we are actively tipping at our Little Packington Landfill which is approximately two miles away from The Brickworks. Our intention is to complete operations at Packington before moving to The Brickworks. This will probably take us approximately 15 years plus into the future. We will however make sure that we submit a suitable Landfill Gas Scheme prior to tipping, whenever that may be.

If you wish to discuss the above, I am always available.

Yours sincerely,

J.T. Turton,
GENERAL MANAGER.



ENVIRONMENTAL PROTECTION ACT 1990

SECTION 37(1)a



INTERNAL-1



OTHER-2

WASTE MANAGEMENT LICENCE NOTICE OF MODIFICATION

LICENCE REF NO :- SL 355 MOD NO 4	FACILITY TYPE :- LANDFILL
LICENCE HOLDER :- BFI Packington Ltd Packington Hall Packington Park Meriden Coventry	LICENSED FACILITY :- Jacksons (Warwickshire) Brickworks Ltd Coventry Road Bickenhill Solihull

WHEREAS on the 3rd August 1982 West Midlands County Council issued a Disposal Licence in pursuance of their powers under Part 1 of the Control of Pollution Act 1974 for the above named facility.

AND WHEREAS on the 1st May 1994 the said licence fell to be treated as a Waste Management Licence,

AND WHEREAS on 1st October 1984, 5th January 1990 and 5th February 1996 the said licence was modified,

AND WHEREAS on the 1st April 1996 the powers and duties of all waste regulation authorities in England and Wales transferred to the Agency by virtue of Section 2 of the Environment Act 1995,

NOTICE IS HEREBY GIVEN that the Agency modifies the following conditions of the said licence :-

REPLACE condition 2(ix) with condition 2(xii) as attached to this notice.

Signed

For Area Waste Manager (Upper Trent)

Name V. Wilkinson

Date

27 June 97

Such modification to take effect on

30 June 97

at 1200 hrs.

YOUR ATTENTION IS DRAWN TO THE RIGHTS OF APPEAL ATTACHED TO THIS NOTICE



2. (xii) Quantities and types of wastes which contain hazardous quantities or hazardous concentrations of any poisonous, noxious or polluting substance, or which are subject to the Regulations in force under Section 62 of the Environmental Protection Act 1990 as listed in paragraph 14 of the Waste Disposal Site Licence Application.

RIGHTS OF APPEAL

Section 43(1) of the Environmental Protection Act 1990 provides that :

Where except in pursuance of a direction given by the Secretary of State,

- (a) an application for a modification of the conditions to the licence is rejected
- (b) the conditions to a licence are modified

the applicant may appeal from the decision to the Secretary of State

Therefore if you feel aggrieved by the decision detailed on the attached notice you may obtain the appropriate form on which to give written notice of an appeal from:-

The Planning Inspectorate,
Room 10/13,
Tollgate House,
Bristol,
BS2 9DJ

TEL 0117 987 8812
FAX 0117 987 8406

This notice of appeal should be accompanied by the following information: a copy of the licence; a copy of any correspondence relevant to the appeal; a copy of any other document relevant to the appeal including, in particular, any relevant consent, determination, notice, planning permission, established use certificate or certificate of lawful use or development; and a statement indicating whether you wish the appeal to be in the form of a hearing or on the basis of written representations. You are also required to serve a copy of your notice of appeal, on the Environment Agency (at the address shown on the notice). You should appeal within 6 months of the date that this notice takes effect but the Secretary of State may allow notice of appeal to be given after the expiry of this time period.

You should note that whilst an appeal is pending the decision detailed on the attached notice is ineffective, except where a statement is included saying that in the opinion of the Agency the details on the notice are necessary for the purpose of preventing, or where not practicable, minimising pollution of the environment, or harm to human health.



ENVIRONMENTAL PROTECTION ACT 1990
SECTION 37 (1) (b)

**WASTE MANAGEMENT LICENCE
NOTICE OF MODIFICATION**

LICENCE REF NO :- SL 355 Mod No 5	FACILITY TYPE :- Landfill Site
LICENCE HOLDER :- S.I.T.A. Packington Limited The Pickeridge Stoke Common Road Fulmer Buckinghamshire SL3 6HA	LICENSED FACILITY :- Land at Jacksons (Warwickshire) Brickworks Ltd Coventry Road Bickenhill Solihull

WHEREAS on the 3 August 1982 the West Midlands County Council issued a Disposal Licence in pursuance of their powers under Part 1 of the Control of Pollution Act 1974 for the above named facility.

AND WHEREAS on the 1 May 1994 the said licence fell to be treated as a waste management licence

AND WHEREAS on the 1 October 1984, 5 January 1990, 5 February 1996 and on the 30 June 1997 the said licence was modified,

AND WHEREAS on the 1 April 1996 the powers and duties of all waste regulation authorities in England and Wales transferred to the Agency by virtue of section 2 of the Environment Act 1995.

AND WHEREAS on 31 March 2000 you applied to modify the licence.

NOTICE IS HEREBY GIVEN that the Agency modifies the following conditions of the said licence as follows :-

Delete conditions 2, 20, 21, 29, 30, 31 40, 41, 42, 43 and 44, and **Add** condition 52 as specified in the attached Notice.

Signed
Team Leader – Waste Licensing

Name Ian Brindley

Date 31 JULY 2000

Such modification to take effect on 31 March 2000 at 12:00 hrs.

YOUR ATTENTION IS DRAWN TO THE RIGHTS OF APPEAL ATTACHED TO THIS NOTICE



Condition 52: Permitted wastes

52.1 Permitted categories and types of wastes

No wastes other than those which are both categorised below in Table 1 and specified in detail in Appendix A to these conditions shall be accepted at the site.

52.2 Permitted quantities of wastes

The quantities of wastes accepted shall not exceed those listed in Table 1 and specified in detail in Appendix A to these conditions.

Table 1. Permitted quantities of waste

Permitted Categories	Waste	Maximum Permitted Quantities (tonnes/year)
Inert wastes		74,999 tonnes/year
Metal wastes		Not Permitted
Special Wastes		Not Permitted
Degradable Household Wastes		Not Permitted
Degradable Commercial Wastes		
Degradable Industrial Wastes		
Other wastes:		Not Permitted

52.3 Exclusion of wastes with other specified characteristics

Notwithstanding the specification of permitted waste types under conditions 52.1 and 52.2 above, wastes shall not be accepted at the site which have any of the following characteristics:

Table 1.1 Excluded wastes of specified form and type

Waste Characteristic	Type
Form and Type:	Powders Sludges Liquids Wet wastes
Properties:	Odour producing Likely to be odour producing
Form of containers and degree of mixing within containers:	Packaged wastes - unmixed Packaged wastes – mixed

APPENDIX A

WASTE TYPES

21.00.00	INERT		
21.01.00	Naturally occurring rocks and sub-soils		
21.01.01	Rock and stone	Including sand, gravel, sandstone, limestone, crushed stone, china clay sand. Clean building or demolition stone such as sandstone, limestone or slate.	Excluding mining wastes, contaminated materials
21.01.02	Sub-soils	Including clays	Excluding organic soils such as topsoil or peat, contaminated materials
21.02.00	Ceramic and/or cemented materials		
21.02.01	Glass	Including fritted enamel	Excluding glass fibre, glass reinforced plastic
21.02.02	Ceramics	Including bricks, tiles, clayware, pottery, china, bricks and mortar	Excluding bricks with plaster
21.02.03	Concrete and/or mortar	Including concrete, reinforced concrete, concrete blocks, breeze blocks, thermalite blocks	Excluding unused cement, blocks with plaster
21.03.00	Processed/prepared mineral materials which have not been used or contaminated		
21.03.01	Moulding sands and/or clays		Excluding sands containing organic binders
21.03.02	Clay absorbents	Including fuller's earth, bentonite	
21.03.03	Other mineral absorbents		Excluding sawdust, plastic
21.03.04	Man-made mineral fibres	Including glass fibre	Excluding glass reinforced plastic, asbestos
21.03.05	Silica		
21.03.06	Mica		
21.03.07	Abrasives		

EXCLUSIONS

Notwithstanding Condition 52, wastes exceeding the ranges of permitted contamination in the attached table shall not be permitted.

RANGES OF PERMITTED CONTAMINATION

Total Concentrations

Determinand	*Leachate Quality Threshold (ug/l unless stated)	Upper Threshold Concentration (mg/Kg air -dried sample)
pH	5.5 - 9.5	5 - 9
Toluene Extract	-	10,000*
Cyclohexane Extract	-	5,000*
Conductivity	1000 us/cm	-
COD	30 mg/l	-
Ammonia	0.5 mg/l	-
Arsenic	10	40
Cadmium	1	15
Chromium (total)	50	1,000
Lead (total)	50	2,000
Mercury	1	20
Selenium	10	6
Boron	2,000	-
Copper	20	-
Nickel	50	-
Zinc	500	-
Cyanide (Complex)	-	250
Cyanide (free)	50	25
Sulphate (SO ₄)	150 mg/l	2,000
Sulphide	150 mg/l	250
Sulphur (free)	150 mg/l	5,000
Phenol	0.5	5
Iron	100	-
Chloride	200 mg/l	-
Polyaromatic Hydrocarbons	0.2	1000

NB

From the above list, wastes to be landfilled shall not exceed the leachate quality threshold and the upper threshold concentration as defined above.

Determined by the application of the National Rivers Authority interim guidance, Research and Development Note 301 entitled "Leaching Tests for the Assessment of Contaminated Land".

* Subject to the provisions of the Regulations in force under Section 62 of the Environmental Protection Act 1990.

RIGHTS OF APPEAL

Section 43(1) of the Environmental Protection Act 1990 provides that:

Where except in pursuance of a direction given by the Secretary of State,

- (a) an application for a modification of the conditions to the licence is rejected
- (b) the conditions to a licence are modified

the applicant may appeal from the decision to the Secretary of State

Therefore if you feel aggrieved by the decision detailed on the attached notice you may obtain the appropriate form on which to give written notice of an appeal from:-

The Planning Inspectorate,
Room 10/13,
Tollgate House,
Bristol,
BS2 9DJ

TEL 0117 987 8812
FAX 0117 987 8406

This notice of appeal should be accompanied by the following information: a copy of the licence; a copy of any correspondence relevant to the appeal; a copy of any other document relevant to the appeal including, in particular, any relevant consent, determination, notice, planning permission, established use certificate or certificate of lawful use or development; and a statement indicating whether you wish the appeal to be in the form of a hearing or on the basis of written representations. You are also required to serve a copy of your notice of appeal, on the Environment Agency (at the address overleaf). You should appeal within 6 months of the date that this notice takes effect but the Secretary of State may allow notice of appeal to be given after the expiry of this time period.

You should note that whilst an appeal is pending the decision detailed on the attached notice is ineffective, except where a statement is included saying that in the opinion of the Agency the details on the notice are necessary for the purpose of preventing, or where not practicable, minimising pollution of the environment, or harm to human health.



ENVIRONMENT
AGENCY

ENVIRONMENTAL PROTECTION ACT 1990

SECTION 39

CERTIFICATE OF COMPLETION

This Certificate of Completion is issued in respect of Waste Management Licence reference number SL355 dated 3rd August 1982 for land at Jackson Brickworks, Bickenhill, Solihull in accordance with section 39(9) of the Environmental Protection Act 1990, the Environment Agency being satisfied that the condition of the land, so far as that condition is the result of the use of the land for the treatment, keeping or disposal of waste (whether or not in pursuance of the licence) is unlikely to cause pollution of the environment or harm to human health in pursuance of section 39(6) of the Environmental Protection Act 1990.

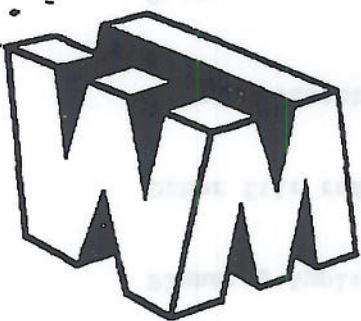
This Certificate of Completion is not to be understood as a warranty, guarantee or assurance by the Environment Agency that the site is fit for any particular use.

Waste Management Licence reference number SL355 dated 3rd August 1982 shall cease to have effect from the date of issue of this Certificate.

Date 31 MAY 2005

Signed
Ian Brindley
Team Leader - Regulatory Waste

The Environment Agency
Sentinel House
Wellington Crescent
Fradley Park
Lichfield
WS13 8RR



Sheet 1 of 6
LICENCE NO. SL 85

WEST MIDLANDS COUNTY COUNCIL

CONTROL OF POLLUTION ACT 1974

LICENCE TO DISPOSE OF WASTE

The County Council of West Midlands in pursuance of the powers conferred on them by the Control of Pollution Act 1974
hereby licence Rawlins Brothers (Birmingham) Limited,
of 228 Drews Lane, Ward End, Birmingham
(hereinafter called the "licence holder")
to deposit controlled waste in accordance with conditions specified herein
on land at Middle Bickenhill Lane, Solihull, West Midlands which is edged
red on the drawing attached to the licence
being land occupied by the licence holder

This licence is granted subject to the conditions set out in the schedule
hereto

Dated this

6TH day of JANUARY 1978

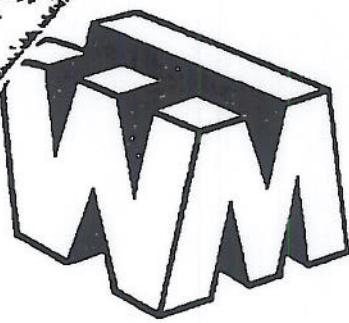
K. Harvey
County Waste Disposal Officer

The licence holder's attention is drawn to the notes overleaf

Notes

These notes are for the general guidance of the Licence Holder and they do not constitute an authoritative statement of the law.

1. This licence only relates to the requirements in the Control of Pollution Act 1974 for the deposit of controlled wastes or the use of plant or equipment subject to the conditions set out in the schedule and does not constitute a consent required by any other legislation. In particular it is the responsibility of the licence holder to comply with any requirements of the Health and Safety at Work etc. Act 1974; the Radioactive Substances Act 1960, the Town and Country Planning Acts, water protection and environmental health legislation.
2. If the licence holder ceases to occupy the land specified above, then he may transfer the licence to the new occupier after giving notice to the County Waste Disposal Officer that he proposes to transfer the licence on a day specified in the notice. The County Council has the right to decline to accept the new licence holder.
3. If the licence holder wishes to cancel this licence, he must return it to the County Waste Disposal Officer together with a notice stating that he no longer requires the licence. Cancellation of the licence will not affect any outstanding liability of the licence holder under the conditions of the licence.
4. The County Council has the right to revoke this licence or vary its conditions in accordance with the provisions of the Control of Pollution Act 1974.
5. The deposit of controlled waste or the use of plant or equipment for the purpose of disposing of controlled waste otherwise than in accordance with the conditions in this licence or the Control of Pollution Act 1974 constitutes a criminal offence.



Sheet 3 of 6

LICENCE NO. SL 85

Conditions for Landfill Site at: Middle Bickenhill Lane, Solihull

Licence Holder: Rawlins Brothers (Birmingham) Limited

Licence No: SL 85

SITE PREPARATION WORKS

1. Within a period of 3 months from the date of issue of this licence the works described in condition (2) must be carried out to divert the watercourse which runs through the site, to the satisfaction of the Water Authority and the Waste Disposal Authority.
 2. The water course shall be excavated to an even gradient and a 5 metre berm left on either side of the watercourse on which no tipping or deposit of excavated spoil shall take place. For a further 3 metres on either side only inert* materials shall be allowed to remain deposited, these being graded and grassed to prevent erosion of tipped material during periods of rainfall or increased flow of the watercourse.

TYPES AND QUANTITIES

3. The types and quantities of wastes deposited daily at the site shall not exceed the following:-

Virgin sub-soil, Inert* hardcore and
Inert* builders rubble

250 tonnes/day

*see notes for definitions

4. Wastes other than those specified in condition (3) shall not be deposited at the sites or brought onto it.

HOURS OF OPERATION

5. (a) Subject to condition 5b waste shall only be brought onto the site and deposited between 07.30 hours and 1700 hours on weekdays, and 07.30 hours and 1600 hours on Saturdays and Sundays.

(b) No waste shall be brought onto the site and/or deposited during the hours of darkness.

CONTROL

6. The site shall be adequately manned and supervised during use.
7. A site control office shall be provided and situated as indicated in the site licence application.
8. Records shall be kept of the types and quantities of wastes deposited. These records shall be open to inspection by representatives of the Waste Disposal Authority at any reasonable time and copies, in a form approved by the Authority, shall be sent to the Authority every month or as may be required by the Authority.
9. The terms of the site licence shall be made known to users of the site and to any persons given responsibility for the management or control of the site. A copy of the licence shall be displayed in a prominent point within the site.

DISPOSAL OF WASTES AND SITE CONTOURS

10. Solid wastes shall be formed into a layer as described in condition (11) as soon as possible after deposit.
11. Waste shall either (a) be deposited on the surface of the site behind the face and partially compacted by a tractor or other compacting machine before being pushed over the face or it shall (b) be deposited on the ground forming the base of the site or on a previous layer in front of the face and shall be formed into a compacted layer by being pushed upwards and driven over by a tractor or other compacting machine.
12. The depth of a layer of waste, shall not exceed 2.5 metres after initial compaction.
13. Before covering working faces and flanks shall be compacted to form gradients not greater than 1:3. Each layer of waste and covering material shall be laid to a fall to encourage surface water run off.
14. No waste material shall be burnt within the boundaries of the site, and a fire at the site shall be regarded as an emergency and immediate action shall be taken to extinguish it. All outbreaks of fire shall be notified forthwith to the Waste Disposal Authority and to the West Midlands Fire Service.
15. Not less frequently than once a week any loose waste which may be lying on the site shall be gathered and disposed of in such a way as to keep the site tidy.



Sheet 5 of 6

LICENCE NO. SL 85

16. Upper layers to a depth of not less than 1 metre shall be kept free of materials likely to interfere with final restoration.
17. Until final restoration, completed areas of landfilling shall be graded and maintained in a tidy condition and where necessary action taken to control weeds.
18. On completion of tipping the final levels achieved, including topsoil shall not exceed those of the land immediately adjacent to the site.
19. Immediately prior to the cessation of tipping the exposed surfaces shall be covered with a layer of topsoil of not less than 300mm (1 ft). This shall be seeded for grass or otherwise drought into agricultural productivity.

ROADS AND SITE SECURITY

20. Adequate measures shall be taken to ensure that mud, debris or any other material is not deposited on the public highway by vehicles leaving the site.
21. A primary site road shall be provided to the satisfaction of the Waste Disposal Authority. This road shall have a hard surface and shall be suitably maintained to assist with the compliance of condition (20).
22. The site shall be bounded by fencing and a gate provided at the site entrance. Any fencing required in order to comply with this condition shall be constructed within a period of 6 months from the date of issue of this licence to a specification and at locations agreed by the Waste Disposal Authority. The gate shall be locked outside working hours and whenever the site is unattended. All other reasonable precautions shall be taken to prevent unauthorised access to the site and/or fly tipping on the site.

OTHER CONDITIONS

23. Within a period of 1 month from the dated issue of this licence a site identification board of durable material and finish must be displayed at the site entrance giving the name address and telephone number of the operator and of the Waste Disposal Authority responsible for issuing the licence.



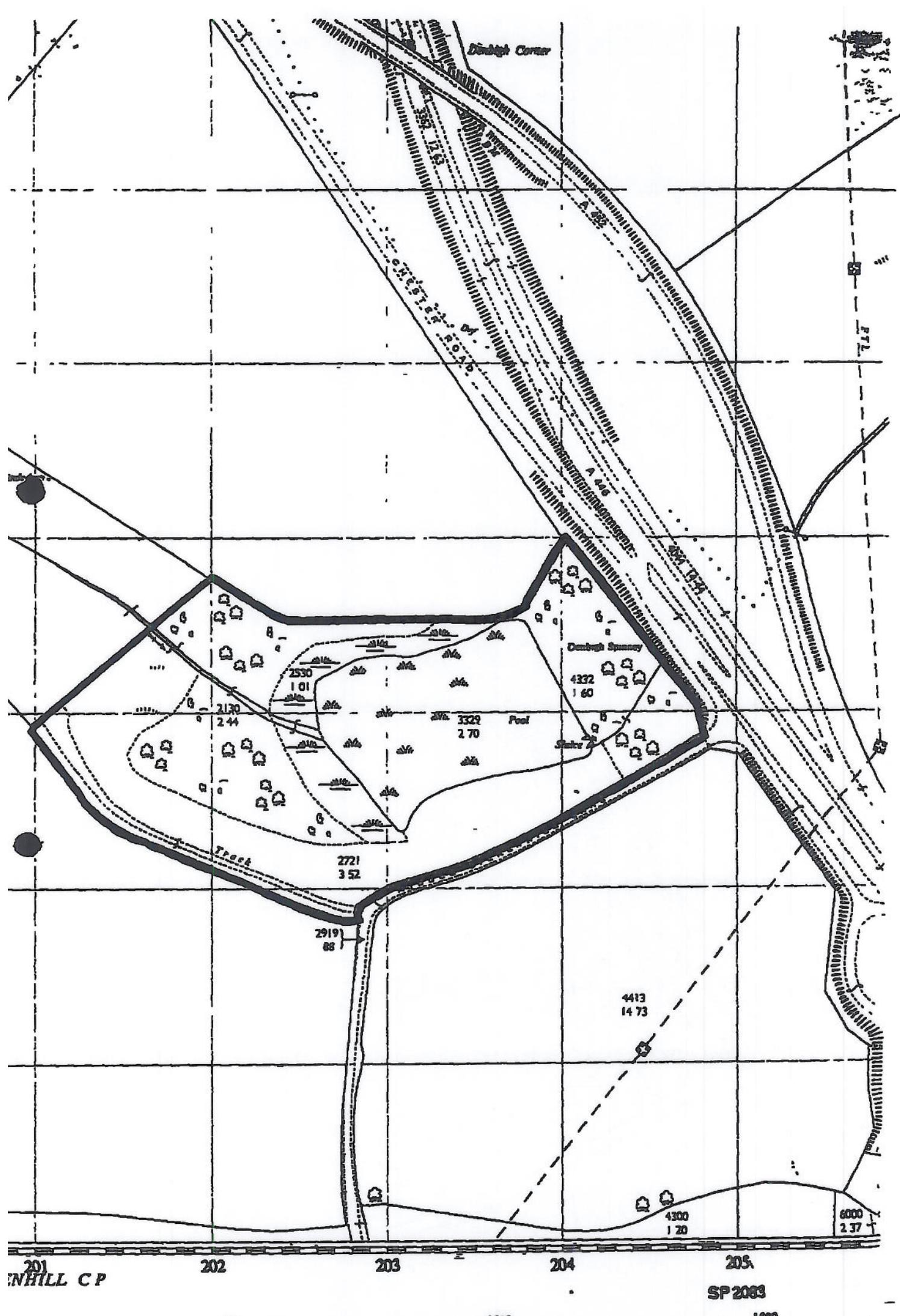
Sheet 6 of 6

LICENCE NO. SL 85

24. Precautions shall be taken to deal effectively with any vermin and insects on the site. All pesticides, pesticidal products and where appropriate pest control techniques shall have been cleared for their intended use through the Pesticides Safety Precautions Scheme. (Viz DOE Circular 80/76 of 24 September 1976).
25. Site drainage facilities shall be maintained such that waters do not accumulate on the site and so that all discharges to watercourse or sewer shall conform to standards laid down by the Severn-Trent Water Authority.
26. Adequate measures shall be taken to prevent public nuisance caused by site operations including noise, dust, fumes, grit and odours.
27. Any temporary cessation of operations for a period in excess of 3 months shall be notified to the Waste Disposal Authority. Not less than 14 days notice shall be given to the Waste Disposal Authority of the date on which landfilling is to recommence in the event of a temporary cessation of operations for a period in excess of 3 months.
28. Written information in respect of any notice or instruction that is received in respect of the site for tipping from any Authority other than the Waste Disposal Authority which in any way relates to the use of the site shall be given to the Waste Disposal Authority within three days of receipt of the said notice or instruction.

NOTES

Inert wastes shall consist of those materials which are without active chemical, physiological, or biological properties and which do not exert "Biochemical Oxygen Demand" in contact with water (as determined by mixing one part material to two parts by weight of aerated water at 20°C, shaking for half-an-hour, filtering the mixture with GFC (glass fibre) filter paper, and conducting a standard 5 day biochemical oxygen demand test on the filtrate) so as to make it anaerobic i.e. devoid of oxygen. The material shall also not contain a significant water soluble content.



SOLIHULL METROPOLITAN BOROUGH COUNCIL
Environmental Protection Act 1990
Register under Section 143

SITE NO. 35

DRAFT ENTRY: OCTOBER 19

REGISTER OF LAND WHICH IS BEING/HAS BEEN PUT TO A CONTAMINATIVE USE

Identifying information

Customary name of site: Denbeigh Spinney, Middle Bickenhill Lane.

Local Authority : Solihull M.B.C.

Civil Parish(es) :
Municipal Ward(s) : Bickenhill

Current land use :

Current OS Map sheet number(s): 2084

OS Map series: : SP 28 SW

OS Map scale : 1:2500

LA Map page number(s) : 7

This record last updated: 08.08.91

Area (Co-ordinate references) : SP 2020 8437
SP 2040 8440
SP 2048 8429
SP 2031 8423
SP 2010 8429

Any known possible contaminants : Unknown
Area (hectares): 4.2HA

Reference(s) of source of information -
O/S 1:2500 1985

Correspondence between source(s) and contemporary map:

Accuracy Accurate.

Entry made: 08/08/91

Planning Application File Nos:

Other file references : Site Licence SL85

Attach extracts of relevant papers/plans etc. to identify source.

POSSIBLY CONTAMINATED (ASHES?)

Landfill Data Sheet



ENVIRONMENT
AGENCY

Reference	EAHLD23759
Site Address	Middle Bickenhill Lane, Bickenhill, Solihull, West Midlands
NGR	420200 284200
Local Authority	SOLIHULL MBC
Site Reference	SL 85, 644/232
REGIS No	
BGS No	
WRC Ref	4600/0084
EA WMLR	
First Input	26/01/1977
Last Input	07/05/1985

Licenced	Yes	Licence Holder Address	
Licence Holder	Rawlins Brothers (Birmingham) Limited		
Licence issued	06/01/1978	Licence Surrendered	
Site Operator			
Site Operator Address			

Inert	Yes	Special	Yes	Gas Control	
Industrial	Yes	Liquid Sludge		Leachate control	
Commercial	Yes	Waste unknown			
Household	Yes	Exempt			

Additional local Information	<input checked="" type="checkbox"/>
This site was a natural depression with the side walls and underlying base being Keuper Marl. The site also has a brook running through it.	
The site had a history of flytipping, particularly around the boundary, of both domestic and industrial waste. This included straw cladding, wooden shelves, shop fittings, waste paper and cardboard, and, as reported on 24th February 1977, mattresses, furniture and tyres.	
Reports do not indicate whether this waste was removed following the issue of the Disposal Licence in 1978 or if it was buried on site.	
The licence permitted the deposit of soil, inert hardcore and inert builder's rubble. The licence holder went into receivership in December 1982 and, because the licence was not transferred at that time, the licence became void.	
Solihull MBC subsequently purchased the site and part of the site was developed into the Olympia Motorcycle Adventure Park.	
The Agency has no information indicating whether any reclamation works were carried out prior to the development of the motorcycle park.	
A report dated 6th October 1988 indicates that a perimeter survey failed to detect significant concentrations of landfill gas.	
The Agency is not aware of any landfill gas monitoring or control measures at this site.	
You may wish to contact the relevant local authority who may hold further information regarding this site.	

SOLIHULL METROPOLITAN BOROUGH COUNCIL
Environmental Protection Act 1990
Register under Section 143

✓ 31/198
SITE NO. 25

DRAFT ENTRY: OCTOBER 1991

REGISTER OF LAND WHICH IS BEING/HAS BEEN PUT TO A CONTAMINATIVE USE

Identifying information

Customary name of site: Brackenlands Farm, Solihull.

Local Authority : Solihull M.B.C.

Civil Parish(es) :
Municipal Ward(s) : Bickenhill

Current land use : Varied. Agricultural, Vehicle & Caravan storage
Kennels

Current OS Map sheet number(s): 1985, 2085

OS Map series: : SP 18 NE, SP 28 SW, SP 28 NW.

OS Map scale : 1:2500

LA Map page number(s) : 4,7

This record last updated: 05/08/91

Area (Co-ordinate references) : SP 1991 8534 SP 2000 8505
SP 2016 8542
SP 2020 8515

Any known possible contaminants:- (see DOC report) Cadmium, Zinc, Lead, Copper
Area (hectares): 7.5 HA

Reference(s) of source of information -
O/S 1:2500 1987

Correspondence between source(s) and contemporary map:

Accuracy Accurate.

Entry made: 05/08/91

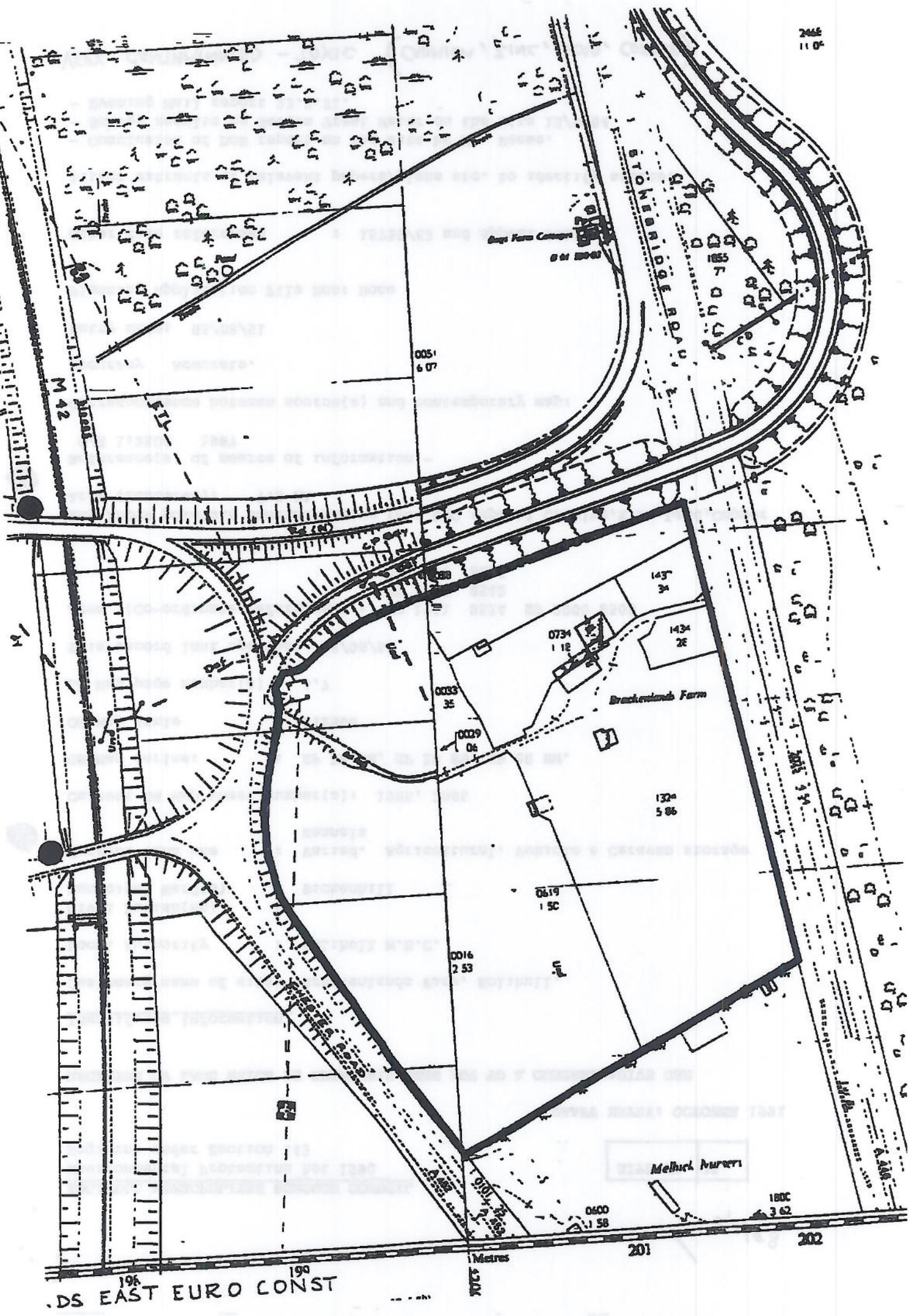
Planning Application File Nos: None

Other file references : 15759/63 and Appeal 1619.

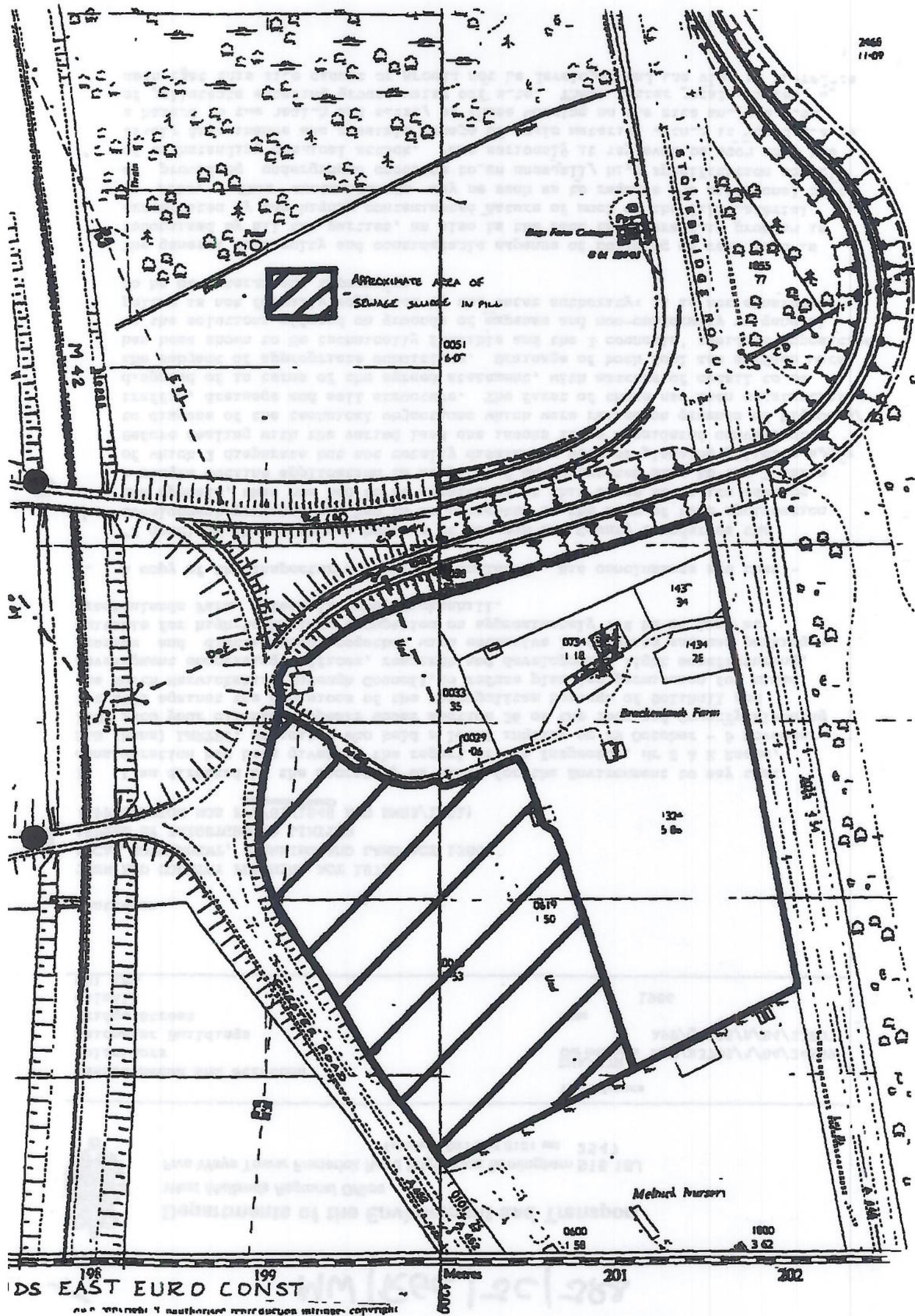
Attach extracts of relevant papers/plans etc. to identify source.

- Conclusion of DoE report on the site by Mr. Reese.
- Survey results by Severn Trent Water on the site 12/9/84
- Evening Mail report 23.7.91.

VERY CONTAMINATED - TOXIC (CADMIUM, ZINC, LEAD, COPPER)



246
11-69





MW|RGC|JC/JRS

PJ/JV

Departments of the Environment and Transport

West Midlands Regional Office

Five Ways Tower Frederick Road Edgbaston Birmingham B15 1SJ

Telephone 021-843 8181 ext 2547

Messrs Haden and Stretton
Solicitors
Leicester Buildings
Bridge Street
Walsall
WS1 1EL

Your reference

DWA/CJN
Our reference APP/R3705/1/84/24559
APP/C4625/A/84/22807

Date

1986

Gentlemen

TOWN AND COUNTRY PLANNING ACT 1971
LOCAL GOVERNMENT, PLANNING AND LAND ACT 1980
APPEAL BY BRIGHTGROUND LIMITED
(APPLICATION NOS F/B/83/1946 AND NW83/1251)

1. I am directed by the Secretary of State for the Environment to say that consideration has been given to the report of the Inspector, Mr S A E Reese, LLB (Hons) LMRTP, Solicitor who held a local inquiry on 29 October - 5 November 1985 into your clients' appeals under section 36 of the Town and Country Planning Act 1971 against the decisions of the Metropolitan Borough of Solihull and the North Warwickshire Borough Council, to refuse planning permission for mixed development comprising, offices, research and development, light manufacturing, storage and distribution, together with extensive landscaping and car parking - suitable for high-technology occupation on approximately 7.6 ha of land at Brackenlands Farm, Coleshill Road, Bickenhill.

2. A copy of the Inspector's report is enclosed. His conclusions are that:-

"I conclude that although because of Borough and County boundaries the development proposed has had to be presented in the form of twin application and appeals, what has had to be considered at this stage is in its essence a single outline application in respect of an integrated site to the 2 parts of which 2 disparate but not totally dissimilar sets of planning policies apply. Before dealing with the varied land use issues it is considered convenient to dispose of the technical objections which were raised on grounds of highways/traffic, drainage and soil structure. The first of these has been substantially disposed of in terms of the agreed statement, with matters of detail to be the subject of appropriate conditions. Drainage of both foul and surface water has been shown to be technically feasible and the 2 councils' residual opposition to the solutions offered on grounds of expense and non-conformity to general policy is not formally supported by the water authority: it is not considered to be of determinant importance.

The general difficulty and considerable expense of building on race land is recognised by all the parties, as also is the fact that here this problem is exacerbated by the highly contaminated nature of much of the fill material on site. This contamination may be such as to require the additional cost of providing underground concrete to an unusually high specification capable of withstanding chemical attack. More seriously it may even be true that the likely circumstance and possible escape of toxic material will in itself create a hazard to the health and safety of those working on the site and the risk of pollutants entering ground water off site. These latter possibilities mean that this site cannot or should not be developed and the view is therefore

taken that if the proposal is considered to be acceptable in land use terms, no grant of planning permission should issue until after further detailed field investigation and laboratory analysis have been completed. It would need to be shown that this site is physically capable of being developed without exorbitant expense, and, more importantly, without significant risk of these potential hazards becoming actual. In the light of the high levels of metallic contamination known to exist in the sludge fill of the site, and of the dangerously high level of cadmium suspected to be present in part of its grass cover, the fears which were expressed at the inquiry on this matter concerning the presence of these and other noxious substances are not fanciful but such as need to be taken very seriously.

In dealing with the land use issues, it has been found convenient to deal first with those arising in the particular context of West Midlands/Solihull planning policies. Although the new high tech policy has not as yet been finally approved, its process along that path has reached such an advanced stage as to require its being taken into account as a material consideration. It has always been generally recognised that the development of 60 ha of land in the vicinity of the M6/M42 motorway interchange, would need the release of land currently covered by some green belt notation. Since this western part of the site lies in a generalised green belt whose boundaries have yet to be precisely defined, its release for development would be less damaging to the green belt concept than would be that of either precisely defined green belt land, or of land in one of the small and physically vulnerable "green wedges", such as, for example, that at Marston Green.

Although just outside the area of the local plan, whether the draft one created by the County Council in 1983, which is in danger of being abandoned before it can become adopted, or the one so recently engendered by the Borough Council, but as yet unformed, this part of the site is within the general search area formulated by the Structure Plan Alterations. If only it possessed the same degree of containment as is enjoyed by the whole site, or if the latter were wholly in the search area, the release of either of such small areas might be considered acceptable. Releasing any of this low quality land should eventually mean that a similar amount of higher graded land elsewhere would be saved for agriculture; and that is a significant consideration. Although to release any land now would be pre-emptive of the local plan's important search, control and release functions elsewhere, that might not be thought - in respect of such small areas - to be too serious a breach of Structure Plan requirements. The lack of the control mechanisms intended to be provided by the local plan, might in such an instance, be made good by the sort of conditions that have been suggested, or by opportunity being afforded for the parties to settle the terms of the statutory agreement.

Although that part of the site in Warwickshire/North Warwickshire is as lowly graded as the western moiety, and with it forms a less than viable farm unit where present appearance is marred by unauthorised uses some of which are, or may be immune to enforcement proceedings, the green belt in which it is located has very recently had its boundaries settled through the agency of an adopted local plan. Additionally, although Warwickshire's Structure Plan, like that of the neighbouring county's, seeks economic resurgence by generally favouring industrial development, no allocations for such use exist in this locality, and the only reservation it specifically makes for high tech is in an area many miles from here. The case against the release of this eastern part of the site is hardened both by the Structure Plan's policy normally to oppose the creation of new industrial or commercial development in the open countryside, and by the local plan's identification of the "Coleshill Corridor" as a particularly vulnerable part of the green belt area: not even the usual development exemptions are available, except for agriculture.

It may well be that in due course a case will be made out for the county and local authority boundaries in this immediate locality to be adjusted so that this smallholding and too, perhaps, the land immediately to the south of it enclosed by the 2 converging main roads, would all fall wholly within the one local planning area. Whatever of that, and opinions might differ as to whether the boundaries should move eastwards or westwards, being as they are, it is requisite to take account of the differing policies applying to the different parts of the appeal site. Taking them together, and having regard for all the relevant guidance from central government, including in particular that contained in Circular 14 of 1985, the final conclusion reached is that the undeveloped acres of both parts of this site perform a valuable green belt function on this vulnerable western edge of the Meriden Gap and should be retained as open land; particularly so since the greater part of the site has so nearly been included in a specially protected area of an adopted local plan green belt." The Inspector recommends that the appeals be dismissed.

3. The Secretary of State agrees with the Inspector's conclusions and accepts his recommendation. Therefore the Secretary of State hereby dismisses the appeal.

4 A separate note is attached setting out the circumstances in which the Secretary of State's decision may be challenged in the High Court.

I am Gentlemen
Your obedient Servant

J. Mata.

'J. Mata
Authorised by the Secretary of
State to sign in that behalf

Appendix 4



SEVERN TRENT WATER
Divisional Manager Robert Hattersley

My Reference ARK/AMN/AP/BLYTHE/GEN.

Severn-Trent Water Authority
Tame Division
Tame House
156/170 Newhall Street
Birmingham B3 1SE

Telephone: 021-233 1616
Telex: 338978

Your Reference

12th September, 1984.

Dear Sirs,

Brackenlands Farm, Bickenhill.

I refer to your letter of the 6th September, 1984, concerning the proposed High Tech development at Brackenlands Farm, Bickenhill.

As you are aware approximately 70,000m³ of sewage sludge from the former Saltley Sewage Works was deposited on part of the site. The analyses of representative samples of this sludge are enclosed for your information.

A further independant survey was also carried out on the sludge to assess the possible toxic effect of metallic radicles on plant life. The analyses were as follows:-

	<u>Sample 1.</u>	<u>Sample 2.</u>
	<u>ppm</u>	<u>ppm</u>
Zn (Zinc)	930	1,300
Pb (Lead)	400	290
Cu (Copper)	460	455
Ni (Nickel)	115	125
Cr (Chromium)	800	545
Cd (Cadmium)	14	5

It was concluded that all the figures were high and in particular zinc, copper, nickel and chromium would be the most likely metals to affect vegetation. The concentrations were considered to be above safe levels with respect to growth of vegetation and it was recommended that top soil be applied at such a thickness so as to prevent plant roots from reaching the affected sewage sludge.

continued.....

Mr. G. Brown,
Brightground Limited,
Property Developments,
51, Fallowfield Road,
Orchard Hills,
Walsall, West Midlands.

When telephoning or writing please contact

Mr. A.M. Noble.
Ext. 2472.

From the Authority's point of view there have been no reported groundwater or surface water pollutions as a result of this activity.

I trust that this answers your queries satisfactorily, but should you have any further problems then please do not hesitate to contact my Area Pollution Control Officer, Mr. A.M. Noble on the number given below.

Yours faithfully,

Piger Key

A.R. Key,
Principal Pollution Control Officer.

Enc.

GENERAL PURPOSES COMMITTEE

28 November 1991

REPORT OF DIRECTOR OF ENVIRONMENTAL HEALTH AND TRADING STANDARDS

1. BRACKENLANDS FARM, CHESTER ROAD, BICKENHILL.

Relevant Policy

Committee Objective 1 - To maintain and enhance the health and safety of inhabitants and those working in or visiting Solihull.

Purpose of Report

The purpose of this report is to advise Committee of the investigations that have been carried out into possible contamination of the above land and the results obtained.

Background

Members will be aware that the above land was the subject of a report published in the Evening Mail on the 23 July 1991.

The report alleged that "tons of poison" was dumped in the fields surrounding Brackenlands Farm with no licence or planning permission being granted. The report indicated that sheep grazing on the farm may be picking up the poison cadmium and family caravans are parked nearby on the site.

Information Known about the Site

About two thirds of the site are within Warwickshire and North Warwickshire Borough Council's area and the remaining one third in the Metropolitan Borough of Solihull. Information available about the site indicates that some 12 acres was used as a shallow pit for the excavation of sand and gravel over a range of depth from 2.5 to 6 metres. This excavated land was later filled with sewage sludge. The sludge originated from the former Saltley Sewage Works and amounted to 70,000 cubic metres. The sewage sludge is known to be contaminated with heavy metals. The sludge was tipped between October 1975 and May 1976. The site is covered with a layer of soil about 0.3 metres deep. The history of the site was discussed in detail at a planning inquiry held in October/November 1985 and is the source of most of the historical data about the site.

Action Taken

In order to respond to concerns about the site the following organisations were contacted:-

- (i) The Planning Section - Technical Services Department
- (ii) Hazardous Waste Unit - Walsall MBC
- (iii) Warwickshire County Council
- (iv) North Warwickshire Borough Council
- (v) National Rivers Authority
- (vi) Ministry of Agriculture, Fisheries and Food.

The view of the Ministry was that from their own examination of the results when first analysed there was no cause for concern but if information to the contrary was received from their Risk Assessment Branch they would take further samples including if necessary, animal samples. If there was evidence to suggest the contamination was entering the food chain they would restrict the use of the animals and/or the land as a food source.

On the 26 July 1991 the Ministry reported that their Risk Assessment Branch advised that there was no risk to humans from animals killed for consumption from the site. Indeed the Ministry considered the risk so slight that they did not propose to take any further samples from the site.

In view of the local level of concern and the fact that the actual sample results could not be shared by the Ministry and consequently their exact location on the site was not known it was decided that this Council would itself take samples from the site. The agreement of the land owner was obtained and a total of 18 samples, 9 of grass and 9 of soil were collected from the site on the 29 July 1991. The samples were collected in accordance with the instructions of staff at Birmingham City Council's Technical and Scientific Complex at Garratts Green who were to analyse the samples. 6 sample locations were chosen on site and 3 off it for comparison. The samples were analysed for the presence of a wide range of heavy metals.

Results of the analysis were received in mid August and the laboratory concluded that while some of the metal concentrations do indicate a contaminated soil, with respect to environmental hazards the figures correspond to those found in typical roadside dusts. The laboratory did note that the exception was for the level of cadmium present in 3 samples where the levels present "are rarely encountered". The three samples concerned were those taken off the site.

The laboratory commented that the grass sample results in the main showed no significant trend. A relatively consistent lead concentration was noted which may be due to the proximity of the motorway network rather than uptake from potentially toxic material historically present in the soil.

These conclusions further reassured initial feelings that there was no risk from the site. However the results were submitted to the Ministry for comment.

On 1 October 1991 a reply was received from the Ministry (copy attached at Appendix 'A') indicating that the Ministry's Risk Assessment Branch had studied the results of the analyses and concluded there does not appear to be any cause for concern.

Conclusion

In view of the above investigations it is felt that there is no currently identifiable risk to human health posed by the site and consequently no further action need be taken at this stage.

The contamination of the land is well known and any development on the site would need to be subject to specialist advice to take account of that contamination.

Implications for the Disabled

None.

Background Documents

Letter from Birmingham City Council Technical and Scientific Complex dated 7 August 1991.

Letter from the Ministry of Agriculture Fisheries and Food dated 30 September 1991.

Recommendation

E.P. The Committee is requested to note the contents of this report.

Документи, які використані для підготовки цього звіту, є відкритими джерелами. Для зберігання та обробки цих даних використовується база даних, яка містить даний звіт та інформацію про розриви у біотопах та видовому складі різних екосистем.

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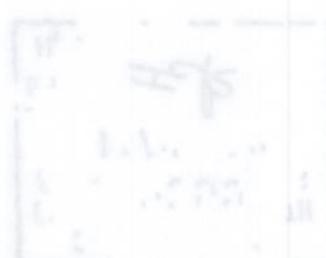
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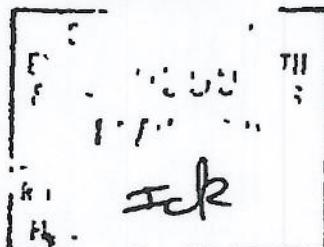
Birmingham City Council

Technical & Scientific Complex

Mr I Keagle
Solihull MBC
Environmental Health &
Trading Standards Dept
PO Box 24
The Council House
SOLIHULL
B91 3EG

7th August 1991

Our Ref : 6131/KHH/JD
Your Ref:



Dear Sir

Report on soils and grasses ex Brackenlands. LSN 6/05594 - 6/05601

The results obtained from the analyses are tabulated on the enclosed sheets. The grasses were first washed to remove any surface matter and then dried with tissues to remove extraneous water.

Conclusions

Soils 7, 8 and 9 have higher contents of all metals except arsenic. When compared to the Greater London Council Guidelines for Contaminated Soils - Suggested Range of Values on air-dried soils, the cadmium figures on 7, 8 and 9 correspond to the Contaminated range. Lead figures for 7, 8 and 9 correspond to Uncontaminated soils, chromium and mercury slight contamination. The suggested figures for zinc, copper and nickel refer to available rather than total metals and, as such, are difficult to compare. However, while it is unlikely that the total concentrations of these three metals are also EDTA extractable i.e. available metals (it would be reasonable to expect the herbage figures to be considerably higher if this were the case), if that assumption is made to illustrate the worst case, then the copper and zinc figures indicate contaminated soil while the metal corresponds to slight contamination.

It should be noted that while some of the metal concentrations do indicate a contaminated soil, with respect to environmental hazards, the figures correspond to those found in typical roadside dusts except for cadmium where the levels found in soils, 7, 8 and 9 are rarely encountered.

The herbage figures, other than those for zinc, show no significant trend. The relatively consistent lead concentrations may be due to the proximity of the motorway network rather than uptake from potentially toxic material historically present in the soil.

If you have any comments, please do not hesitate to contact me.

Yours faithfully

A handwritten signature in black ink, appearing to read 'K E Howe'.

K E Howe

PRINCIPAL SCIENTIFIC OFFICER

Birmingham City Council
Technical and Scientific Complex
Valepits Road
Genetics Green
Birmingham
B33 0TD

Telephone: 021-789 7070
FAX 021-789 7330

6131/KER/JD
9/8/91

GRASSES

RESULTS ON HERBAGE AFTER WASHING AND DRYING SURFACE MOISTURE. mg/Kg.

<u>LEN</u>	6/05584	6/05586	6/05588	6/05590	6/05592	6/05594	6/05596	6/05598	6/05600
<u>SOLINULL REP</u>	02612	02614	02616	02618	02620	02623	02625	02627	02629
<u>GRASS NUMBER</u>	1	2	3	4	5	6	7	8	9
Zn	6.6	8.8	7.6	4.9	4.4	4.5	19	20	34
Cd	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.2
Pb	4.1	3.8	1.9	4.8	<0.1	2.5	3.9	0.7	9.0
Ni	1.9	1.8	1.4	0.8	1.0	0.7	1.0	0.6	4.5
Cr	<0.1	0.6	1.8	1.5	0.6	0.8	0.9	0.9	1.6
Cu	1.6	3.0	3.7	1.5	1.8	1.1	3.9	2.1	4.7
As	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

6131/KER/JD
9/8/91

GRASSES

DRY WEIGHT RESULTS AT 105°C mg/Kg

<u>LSN</u>	6/05584	6/05586	6/05588	6/05590	6/05592	6/05594	6/05596	6/05598	6/05600
<u>SOLIHULL REF</u>	02612	02614	02616	02618	02620	02623	02625	02627	02629
<u>GRASS NUMBER</u>	1	2	3	4	5	6	7	8	9
Zn	23	44	48	25	22	20	67	84	100
Cd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.6
Pb	14	19	12	24	<0.5	11	14	3.0	27
Ni	6.6	9.1	8.9	4.0	5.0	3.1	3.6	2.5	13
Cr	<0.5	3.0	11	7.6	3.0	3.5	3.2	3.8	4.7
Cu	5.6	15	24	7.6	9.0	4.8	14	8.9	14
As	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Loss @ 105°C
% w/w

71.2	80.2	84.3	80.2	80.1	77.2	72.6	76.3	66.1
------	------	------	------	------	------	------	------	------

6131/KEN/JD
9/8/91

SOILS

AS RECEIVED RESULTS mg/kg

LSN	6/05585	6/05587	6/05589	6/05591	6/05593	6/05595	6/05597	6/055989	6/05601
SOLIHULL REP	02613	02615	02617	02619	02622	02624	02626	02628	02630
SOIL NUMBER	1	2	3	4	5	6	7	8	9
Zn	81	73	160	100	65	120	360	590	570
Cd	0.1	1.8	1.1	0.9	1.0	0.8	3.4	7.5	6.9
Pb	33	33	29	24	35	31	120	160	150
Ni	20	19	13	7.4	3.9	12	32	43	41
Cr	46	39	42	21	14	30	86	120	120
Cu	20	17	120	36	31	67	240	570	540
As	2.9	3.5	2.2	1.9	2.2	2.0	1.7	2.0	2.7
Hg	<0.1	0.4	0.3	0.3	0.1	0.2	0.6	1.6	1.4

SOILS

6131/KEH/JD
9/8/91

DRY WEIGHT RESULTS AT 105°C mg/Kg

<u>LEN</u>	6/05585	6/05587	6/05589	6/05591	6/05593	6/05595	6/05597	6/055989	6/05601
<u>SOLIHULL REF</u>	02613	02615	02617	02619	02622	02624	02626	02628	02630
<u>SOIL NUMBER</u>	1	2	3	4	5	6	7	8	9
Zn	93	81	190	130	78	150	390	630	610
Cd	0.1	2.0	1.3	1.1	1.2	1.0	3.8	8.1	7.4
Pb	38	37	34	30	40	38	130	170	160
Ni	23	21	15	9.3	4.7	15	36	46	44
Cr	53	43	49	26	17	36	96	130	130
Cu	23	19	140	45	37	81	260	610	570
As	3.3	3.9	2.6	2.4	2.7	2.4	1.9	2.1	2.9
Rg	<0.1	0.5	0.3	0.4	0.1	0.2	0.7	1.7	1.4

Loss @ 105°C 12.8 10.8 14.3 20.6 17.0 17.4 10.1 6.7 6.1
% w/w



Ministry of Agriculture Fisheries and Food

Block C, Government Buildings, Whittington Road, Worcester WR5 2LQ
Telephone: Worcester (0905) -763355 ext. GTN: 6180
Telex: 337366 Fax: 0905 - 763180

SJA

I Keagle Esq
Environmental Health and Trading Standards Dept
Solihull MBC
PO Box 24
Council House
SOLIHULL, West Midlands B91 3EG

Your reference

Our reference 6213

Date 30 September 1991

1-OCT 1991

JCK
SS

Dear Mr Keagle

POSSIBLE HEAVY METAL CONTAMINATION: COLESHILL

Further to my letter of 27 September 1991 I am writing to confirm that the Ministry's Risk Assessment Branch has studied the results of the grass and soil sample analysis provided by your department.

They state that it is unlikely that there would be any contact between the sewage sludge layer and the roots of grass, and based on the soil data there does not appear to be any cause for concern.

Yours sincerely

John Williamson

J R WILLIAMSON

Landfill Data Sheet



ENVIRONMENT
AGENCY

Reference	EAHLD23554
Site Address	Chester Road, Coleshill, Warwickshire
NGR	419900 285200
Local Authority	NORTH WARWICKSHIRE BOROUGH COU
Site Reference	644/2153
REGIS No	
BGS No	
WRC Ref	3700/9023
EA WMLR	
First Input	06/05/1975
Last Input	15/02/1977

Licenced	<input type="checkbox"/>	Licence Holder Address	<input type="text"/>
Licence Holder	<input type="text"/>		
Licence issued	<input type="text"/>	Licence Surrendered	<input type="text"/>
Site Operator	<input type="text"/>		
Site Operator Address <input type="text"/>			

Inert	<input type="text"/>	Special	<input type="text"/>	Gas Control	<input type="text"/>
Industrial	<input type="text"/>	Liquid Sludge	<input type="text"/>	Leachate control	<input type="text"/>
Commercial	<input type="text"/>	Waste unknown	<input type="text"/>		
Household	<input type="text"/>	Exempt	<input type="text"/>		

Additional local Information <input checked="" type="checkbox"/>
The underlying geology of the site consists of Quaternary sand and gravel over Mercia Mudstone.
Concerns were expressed in relation to the possible contamination of this site, subsequently a desk study was carried out by CL Associates and published in 1993.
The study indicates that the site had been used as a shallow pit for the excavation of sand and gravel to a depth ranging from 2 - 6 metres. The excavated material was utilised in the construction of the M42 Motorway.
The resulting void was filled with an estimated 70,000 tonnes of sewage sludge arising from the former Saltley Sewage Works. The site was subsequently covered with 0.3 metres of soil.
It is believed the sewage sludge was contaminated with heavy metals. The Agency holds no details of any restoration works carried out on the site.
You may wish to contact the local authority which may hold further information regarding this site.

It must be understood that the information provided above is based on records and files from various sources and of varying reliability. Consequently the Environment Agency is not able to offer any warranty as to the accuracy or completeness of the information provided, nor can it accept any liability whatsoever for any loss or damage arising from the interpretation and/or use of the information. A site inspection has not been carried out in relation to your request for information.

Landfill Data Sheet



ENVIRONMENT
AGENCY

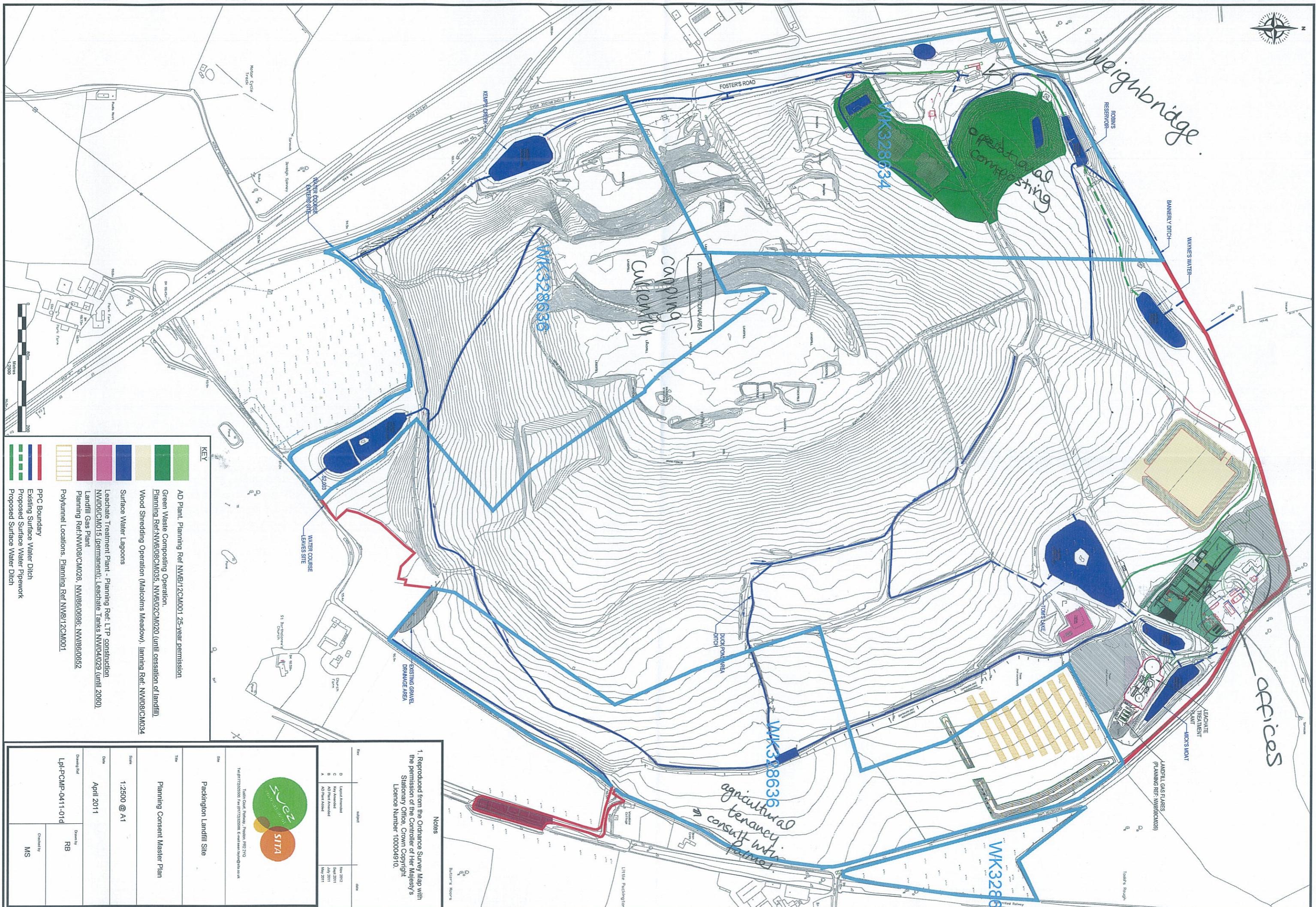
Reference	EAHLD23757
Site Address	Windbridge Nurseries
NGR	419000 283100
Local Authority	SOLIHULL MBC
Site Reference	644/614, SL 316
REGIS No	
BGS No	
WRC Ref	4600/0169
EA WMLR	
First Input	31/12/1979
Last Input	31/12/1982

Licenced	Yes	Licence Holder Address	
Licence Holder	West Midlands(Excavations Limited)		
Licence issued	12/03/1980	Licence Surrendered	30/04/1994
Site Operator Address			
Site Operator			

Inert		Special		Gas Control	
Industrial		Liquid Sludge		Leachate control	
Commercial		Waste unknown			
Household		Exempt			

Additional local Information	<input checked="" type="checkbox"/>
This site is a natural depression with an underlying base consisting of Mercia Mudstone.	
The site was operational prior to the provisions of site licensing, but was subsequently issued with a licence, as detailed above, for the disposal of excavated natural soil, concrete and brick rubble spoil.	
Records indicate that some unpermitted wastes, tree stumps and scrap metal, were deposited at the site in November 1981. The licence holder was directed to remove these wastes but in early 1982 the company went into liquidation, without removing these materials, although waste deposits did cease at this time.	
Reports from 1985/86 indicate that the site was still incomplete.	
The Agency is not aware of any landfill gas monitoring or control measures at this site.	
You may wish to contact the relevant local authority who may hold further information regarding this site.	

It must be understood that the information provided above is based on records and files from various sources and of varying reliability. Consequently the Environment Agency is not able to offer any warranty as to the accuracy or completeness of the information provided, nor can it accept any liability whatsoever for any loss or damage arising from the interpretation and/or use of the information. A site inspection has not been carried out in relation to your request for information.



Landfill Data Sheet



ENVIRONMENT
AGENCY

Reference	EAHLD28503
Site Address	Coleshill
NGR	420300 286100
Local Authority	NORTH WARWICKSHIRE BOROUGH COU
Site Reference	WDL050, 644/2066
REGIS No	
BGS No	
WRC Ref	3700/0050
EA WMLR	
First Input	31/12/1966
Last Input	31/12/1980

Licenced	Yes	Licence Holder Address	
Licence Holder	Warwickshire County Council, County Engine		
Licence issued	04/05/1977	Licence Surrendered	
Site Operator		Site Operator Address	

Inert		Special		Gas Control	
Industrial		Liquid Sludge		Leachate control	
Commercial	Yes	Waste unknown			
Household	Yes	Exempt			

Additional local Information	<input checked="" type="checkbox"/>
The underlying base of this site is glacial sand overlying Keuper Marl.	
The site consists of an old sand quarry, which is believed to have accepted waste prior to the provisions of waste licensing.	
The site was subsequently licensed, as detailed above, for the deposit of untreated domestic and commercial wastes, non-hazardous industrial waste, hardcore and inert cover materials.	
The Agency has no details to confirm the exact extent or types of waste deposited at this site.	
The Agency has no knowledge of any environmental monitoring or controls at this site.	
You may wish to contact the local authority which may hold further information regarding this site.	

It must be understood that the information provided above is based on records and files from various sources and of varying reliability. Consequently the Environment Agency is not able to offer any warranty as to the accuracy or completeness of the information provided, nor can it accept any liability whatsoever for any loss or damage arising from the interpretation and/or use of the information. A site inspection has not been carried out in relation to your request for information.



A Geological Investigation &
Mineral Reserves Assessment of
PARK FARM, Bickenhill
Nr Solihull, Birmingham

November 2011



**PACKINGTON ESTATE
ENTERPRISES LIMITED**

Quality Assurance Review

Project Name: A Geological Investigation & Mineral Reserves Assessment of PARK FARM, Bickenhill, Nr Solihull, Birmingham

Project Ref: ES Geology.doc

Project No.: PEE/PKF/101

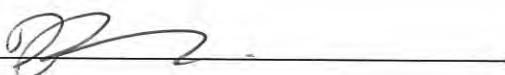
Version: Final 1.0

Client: Packington Estate Enterprises Ltd
Packington Hall
Meriden
Warwickshire
CV7 7HF

Prepared by: D J Ryan

Date: 1st November 2011

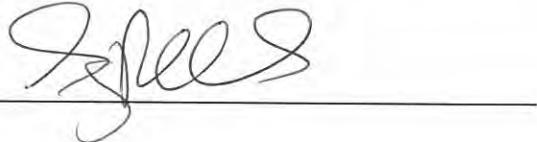
Signed:



Reviewed by: S.J.Rees

Date: 1st November 2011

Signed:



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FIGURES & PLANS

Figure F 1	Location Map
Figure F 2	Site Plan & Borehole Locations
Figure F 3	Base of Mineral Contours & Potential Extraction scheme
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Figure F 5	Upper Sand Thickness Contours
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ES Geol 1	Site Plan, Extraction Areas and Borehole Locations

TABLES

Table 1	General Stratigraphy of the Solihull Area
Table 2	Summary of Borehole Results
Table 3	Grading Analyses of Borehole Samples

APPENDICES

Appendix 1	Slope Stability Analysis
------------	--------------------------

1. INTRODUCTION

1.1 Background

- 1.1.1 Packington Estate Enterprises Limited (PEEL) has a number of farming and commercial interests located just to the east of Birmingham, which form part of the historical estate of Lord Aylesford. The proposed route of the new High-Speed Railway (HS2) to link London and Birmingham was published in late 2010 that showed a proposed station, car park and new road development for the railway on land owned by PEEL at Park Farm. This land is mainly arable farmland with a series of small office units developed within the out-buildings of the farm complex.
- 1.1.2 Historical work on the Park Farm site has indicated that potential reserves of sand and gravel may be present beneath the land to be affected by the HS2 development, thus PEEL commissioned Greenfield Associates to undertake a detailed mineral assessment of the Park Farm site to determine if workable reserves of sand and gravel are present.
- 1.1.3 This work included a borehole drilling investigation to confirm the thickness of the sand and gravel deposits within the Park Farm site, estimate the potential reserves present together and provide an assessment of the quality of the deposits proved to determine their suitability for producing a range of aggregates for the local construction market.

1.2 Previous Mineral Investigations

- 1.2.1 In March 1969, The Midland Gravel Company Ltd (part of the Blue Circle Group) investigated the Park Farm site, by drilling some 40 boreholes. There are no borehole records available from this work, but it is known that a workable deposit of mineral was proved.
- 1.2.2 It is known that these mineral reserves were never worked and that no proposals to extract the minerals have previously been forwarded to the local planning authority.

2. SITE DESCRIPTION

2.1 Location

- 2.1.1 Park Farm is located between the conurbations of Birmingham and Coventry and is centred at Grid Reference [SP 206 835], as shown in Figure F1. It lies just within the Metropolitan Borough of Solihull and is accessed via the A452 that connects the A45 and the M6/M42 motorways.
- 2.1.2 The site lies approximately 3km to the east of Solihull and some 10km to the east of Birmingham city centre. Approximately 1km to the west of the site lies the NEC and Birmingham International airport, but the nearest residential properties are located at Middle Bickenhill that lies just beyond the south-western boundary of the landholding.
- 2.1.3 The western boundary of the Park Farm site is formed by Middle Bickenhill Lane. This joins the old Coventry Road and the A45, which forms the southern boundary of the site, with the western boundary formed by the A452.

2.2 Topography

- 2.2.1 The land investigated at Park Farm is situated on the high level plateau that forms the western flank of the Blythe River Valley that lies generally at an elevation of about 98m AOD. The site is crossed by an easterly flowing stream (Hollywell Brook) that lies at a level of about 85m AOD, which joins the northerly flowing Blythe River about 300m to the east of the site (see Figure F2). The Hollywell Brook lies within a prominent valley that separates the site in to two areas (see Plan ES Geol 1) that are farmed for a range of arable crops.
- 2.2.2 The site is also crossed by a dismantled railway line that trends north-northeast across the southern part of the site. This old railway line crosses the Hollywell Brook via a large brick culvert and the dismantled line has become an area of predominantly woodland and scrub habitat.
- 2.2.3 To the northeast of the Park Farm site lies a major waste disposal (landraise) site where waste operations have been taking place for over 40 years. To the east and south, beyond the major roads, the land generally rises gently to over 100mAOD, with the landscape formed principally by agricultural land, with small copses of the woodland.

3. GEOLOGY

3.1 Regional Geology

- 3.1.1 The published regional guide for this area (Central England) shows that the oldest strata mapped in this area are the Coal Measures of Carboniferous age, which are overlain across most of the region by the reddish brown clays and mottled mudstones of the Mercia Mudstone Formation of Triassic age.
- 3.1.2 Extensive deposits of Glacial and Fluvial Drift are also mapped in this area, comprising deposits of Glacial Sand and Gravel, Boulder Clay and River Terrace Deposits, as shown in Table 1 below.

Table 1 General Stratigraphy of the Solihull Area

<i>Drift</i>	
	Alluvium
Pleistocene	River Terrace Deposits
	Boulder Clay
	Glacial Sand & Gravel
<i>Solid</i>	
Triassic	Mercia Mudstone Sherwood Sandstone
<hr/>	
Carboniferous	Coal Measures

- 3.1.3 The bedrock mapped in the Park Farm area is the Mercia Mudstone that has a thickness of over 100m.

3.2 Drift Geology

- 3.2.1 The published geological information includes a Mineral Assessment Report (MAR 115 – Solihull) published by the British Geological Survey. This report together with other published information confirms Glacial Drift covers the majority of the Solihull area in an irregular pattern, dissected by the present drainage network. The Glacial drift sequence appears to have been deposited during a major period glaciation, where outwash sands and gravels were deposited during the retreat of the ice sheets.

- 3.2.2 The Glacial Sand and Gravel mapped within the Solihull area (and also extracted from a number of local pits) usually comprises a sequence of mainly sands, with sands and gravels present towards the base of the deposit. These deposits have a maximum proven thickness of 17m, but where proved generally range in thickness from 3m to 8m in thickness.
- 3.2.3 The gravel fraction is usually described as "Bunter quartzite" in a matrix of quartzitic fine to medium sand which has a reddish/ pinky brown to yellowish brown colour. Boulder Clay is occasionally mapped in the area overlying the sands and gravels comprising stiff, reddish brown pebbly clay.

4. SITE APPRAISAL

4.1 Borehole Drilling Investigation

4.1.1 A total of 10 Shell & Auger boreholes (PKF1 to PKF 10) were drilled by CT Jones Drilling Ltd between the 21st December 2010 and 13th January 2011 at the locations shown in Figure F2 and Plan ES Geol 1 located in the northern part of the Park Farm site. An additional borehole (A45-1) was also drilled in the southern part of the site (to the south of the Hollywell Brook) adjacent to the A45.

4.1.2 The boreholes were drilled to determine the thickness of the mineral deposits present and also to assess the quality of the sand and gravel deposits proved. Bulk samples were collected during the drilling operations at regular (at least 1.5m) intervals and all of the borehole samples were logged by Greenfield Associates. Detailed geological logs were prepared, and a summary of these is presented in Table 2.

4.1.3 To assess the presence of a water table within the mineral deposits proved, a total of three water monitoring standpipes were installed with boreholes PKF2, 3 and 4, as shown on Plan ES Geol 1.

4.2 Aggregate Testing

4.2.1 Following the logging of the borehole samples, a representative number of samples (15) were despatched to Enverity Laboratories Ltd to assess the particle size distribution of the deposits proved. The results of the grading analyses are summarised in Table 3.

4.3 Topographical Surveying

4.3.1 The location of all of the boreholes drilled were surveyed by Greenfield Associates on 11th January 2011, together with the ground levels and site boundaries. The site survey has been co-ordinated to the Ordnance Survey base plan of the site, as the survey work was undertaken using GPS linked directly with OS via the Trimble VRS system.

4.3.2 The water levels within the Hollywell Brook were also surveyed during the site survey; so that these levels can then be used to compare groundwater levels within the boreholes drilled.

4.4 Trial Pitting

4.4.1 10 trial pits were excavated during September 2011 mainly within the south-eastern (Phase 4) area of the site to assess the spread and quality of the glacial deposits in this area (see plan ES Geol 1). Trial pits were also excavated within the plant area to assess the ground conditions and also within the southern (marginal) areas of the Phase 1 and 2 areas.

5. RESULTS

5.1 Borehole Results

- 5.1.1 The Shell and Auger boreholes drilled on this site proved that workable deposits of sand and gravel are present within the land to the north of Hollywell Brook, to the west and south-east of the Park Farm complex and in the south east of the site, south of the Hollywell Brook.
- 5.1.2 In the southern part of the site near to the A45, only limited amounts of sand and gravel (2.8m) were proved within Borehole A45-1, but in the land to the north of Hollywell Brook the sand and gravel deposits proved in the boreholes range in thickness from only 0.9m in borehole PKF3 to a maximum of about 10.5m in borehole PKF9 (see figure 3 and 4).
- 5.1.3 The borehole drilling also confirmed that the mineral deposits are divided in to an upper sequence of mainly fine to medium reddish brown sand overlying a generally coarse sand and gravel deposit. All of the boreholes were terminated in firm, reddish brown Mercia Mudstone bedrock.

5.2 Upper Sand Unit

- 5.2.1 The upper sand unit was proved in all of the boreholes drilled in the northern part of the site, except Borehole PKF3 where pebbly clay was proved beneath the soil, which overlay the basal sand and gravel deposit. This upper sand unit comprises mainly fine to medium grained quartz sand with occasional quartzite pebbles, which is generally slightly silty to silty. Where proved it ranges in thickness from 1.8m (in borehole PKF6) to a maximum of 7.0m in PKF9. The sand thickness s shown on figure 5.
- 5.2.2 Occasional thin clay partings and silt lenses have been proved in the borehole samples, but this sand appears to have consistent properties where proved across the site.

Table 2 Summary of Borehole Information

Borehole	Borehole Co-ordinates		Surface Level	Overburden Thickness	Base of Overburden	Upper Sand Thickness	Interburden/ Basal Clay Thickness	Lower S&G Thickness	Bedrock Level - Mercia Mudstone	Notes
	Easting	Northing	m AOD	m	m AOD	m	m	m	m AOD	
PKF1	420416	284199	97.13	0.9	96.2	6.6	1.5	0.0	88.1	
PKF2 W	420419	284009	99.06	1.0	98.1	3.5	2.5	5.0	87.1	Water monitoring BH
PKF3 W	420793	283656	93.27	3.1	90.2	0.0	0.0	0.9	89.3	Water monitoring BH
PKF4 W	420299	283879	96.67	0.5	96.2	3.0	0.0	0.0	93.2	Water monitoring BH
PKF5	420362	284102	97.40	0.9	96.5	7.1	0.0	3.5	85.9	
PKF6	420498	283902	97.57	0.7	96.9	1.8	0.0	4.1	91.0	
PKF7	420776	283854	97.51	0.6	96.9	4.4	2.0	4.5	86.0	
PKF8	420731	283764	96.20	0.7	95.5	3.3	0.4	5.1	86.7	
PKF9	420516	284124	98.84	1.0	97.8	7.0	1.5	3.5	85.8	
PKF10	420639	283848	99.70	0.7	99.0	5.8	0.0	2.5	90.7	
A45-1	420669	283190	96.82	0.7	96.1	0.0	2.1	2.8	91.2	

5.3 Lower Sand and Gravel Unit

- 5.3.1 The lower sand and gravel unit was proved in all of the boreholes drilled in the eastern and central parts of the site. However, in the western (borehole PKF4) and northern (PKF1) areas, this deposit was not proved beneath the sand.
- 5.3.2 Where proved, the sand and gravel comprises fine to coarse, reddish/ pinky brown quartz sands with well rounded quartzite gravels and occasional cobbles. The gravel fraction generally forms the majority of the deposit, as shown in plates of typical borehole samples. The borehole drilling has proved the lower sand and gravel ranging in thickness from 0.9m (PKF 3) to 5.1m in borehole PKF8. The lower sand and gravel thicknesses are shown on Figure 6.

5.4 Overburden & Interburden

- 5.4.1 The overburden proved in the boreholes generally comprised soil and sandy sub-soil up to 1m in thickness. However, in borehole PKF3 adjacent to the dismantled railway line, a unit of soil and pebbly clay (to a depth of 3.1m) was proved overlying only 0.9m of sand and gravel. In Borehole PKF2 a unit of sandy clay was present to a depth of 2.5m.
- 5.4.2 Within the boreholes in the eastern part of the site, a unit of pebbly clay interburden was proved (ranging in thickness from 0.4m in PKF8 to 2.0m in PKF7) within the lower sand and gravel unit. This clayey unit also contains black organic material which was also proved in the pebbly clay overburden in PKF3 and with a 1.5m thick sandy clay present within PKF9. It is inferred that due to the fall in the topography, the interburden crops out at surface in PKF3 where it then becomes the overburden to the sand and gravel deposit.

5.5 Groundwater Levels

- 5.5.1 All of the boreholes drilled as part of this drilling investigation were dipped to determine the groundwater levels across the site. During the borehole drilling groundwater was rarely encountered, but three monitoring standpipes were installed boreholes PKF2, 3, and 4.
- 5.5.2 Preliminary monitoring of these boreholes indicates that groundwater lies towards the base of the lower sand and gravel, about 1.5m above the bedrock Mercia Mudstone. It is inferred that the water detected may be perched water within the sands and gravels, but this will be confirmed by further monitoring.

6. MINERAL QUALITY

6.1 Grading Analyses:

- 6.1.1 A total of 15 borehole samples were tested to determine the particle size distribution (gradings) of both the Upper Sand and Lower Sand and Gravel deposits that were proved within the proposed extraction area of the site. These results are given in Table 3.
- 6.1.2 The results confirm that the Upper Sand deposit has a very consistent grading. The Lower Sand and Gravel deposits however, showed a wide spread of grading curves indicating a typically variable Glacial deposit.
- 6.1.3 The fines (-63 micron) content of the 15 samples tested is also relatively consistent, ranging from 0.7% to a maximum of 5.6%, but it is inferred that the adding of water during the drilling operations may wash some of the fine content from material, thus the occasional very low fines content recorded may be considered as an under-estimate.

6.2 Grading Analyses: Upper Sand

- 6.2.1 The seven borehole samples of the Upper Sand tested have a recorded fines/silt (63 micron) content that ranges from 2.0% to a maximum of 5.6%. Very little (1%) gravel sized material (+4mm) was proved within the samples tested, but occasional pebbles were commonly recorded within the borehole samples that were collected during the borehole drilling.
- 6.2.2 The sand fraction (-4mm +63um) is comprised mainly of fine to medium quartz grains that are generally pinky-brown to white in colour. Only a small fraction of the samples tested (5%) comprised coarse sand (+1mm) within the Upper Sand deposit. When the sand fraction (-4mm) of the deposit is plotted the Upper Sand deposits fits well within the historical grading limits for use as a building sand (BS1200 Type S and Type G). It is therefore suggested that only dry screening would be required to remove any of the +4mm fraction to produce a building/ mortar sand product.

Table 3 Summary of Mean Borehole Grading Information

	Percentage Passing- Sieve Size mm														
	0.063	0.125	0.25	0.5	1.0	2.0	4.0	6.3	10.0	16	20	31.5	40	80	
Upper Sand	4.1	6	27	82	95	99	99	100	100	100	100	100	100	100	
Lower S&G	2.5	3	8	23	30	32	36	40	45	55	62	77	86	100	

	Fines (-63u)	Sand (-4mm)	Gravel (+ 4mm)
Upper Sand	4% (2-6%)	95%	1%
Lower S&G	3% (1-5%)	33%	64%

6.3 Grading Analyses: Lower Sand & Gravel

- 6.3.1 Within the proposed extraction area, a range of boreholes that proved the Lower Sand & Gravel were tested. The results of the laboratory analyses are again given in Table 3.
- 6.3.2 The laboratory results for these samples confirm that these deposits are generally gravel-rich, with a mean gravel content (+4mm) of 64%, ranging from 31% to 86%. The gravel fraction comprises mainly rounded to well-rounded quartzite pebbles that are pinky-brown to white in colour. The laboratory testing also confirms that in all of the samples, material greater than 20mm in size is present, with oversize material (+40mm) commonly present. The mean oversize content of the samples is 14%, ranging from 0% to 40%.
- 6.3.3 The mean sand fraction (-4mm) of the Lower Sand & Gravel forms 33% of the deposit and comprises mainly medium (56%) and coarse (22%) sand grades. The fine sand fraction (-250 micron) forms only 15% of the sand fraction.
- 6.3.4 The grading curves of the sand fraction (-4mm) from of the Lower Sand and Gravel samples tested confirm that the material could be washed to produce a medium grade concreting sand. The grading curves indicate that there is an excess amount of the coarser grades, but these can be removed during processing, or finer sand material from the upper sand could be added to produce a more evenly graded concreting sand product.
- 6.3.5 The laboratory test results have also confirmed that the Lower Sand & Gravel Deposits are generally “clean”, with a mean recorded fines/ silt content of only 2.5%, ranging from 0.7% to a maximum of 5.2%. This equates to mean fines content of 7% when considering the sand fractions only. For concreting sand, a maximum fines content in the range 0%to 3% is permitted so the sands would have to be washed to remove this material.

7. POTENTIAL MINERAL RESERVES

7.1 Potential Site Reserves

- 7.1.1 It is estimated that within the potential extraction area of 19.04 ha on the Park Farm site (shown on Plan ES Geol 1), the total saleable reserves of Glacial Sand and Glacial Sand and Gravel is approximately 1.68 million tonnes after production losses. The tonnage of saleable Glacial Sand is estimated to be ~0.89 million tonnes and the tonnage of saleable Glacial Sand and Gravel is estimated to be ~0.79 million tonnes.
- 7.1.2 To extract these reserves it is estimated about 130,000m³ of overburden would have to be removed as part of the excavation of the mineral reserves.
- 7.1.3 Initial groundwater monitoring has indicated that the water table is perched at the base of the mineral deposits, thus it is inferred that the Glacial Sands and the Glacial Sand & Gravel can be worked dry without the need for any dewatering.

8. GEOTECHNICAL CONSIDERATIONS

8.1 Slope Stability

- 8.1.1 The quarry design produced for the Park Farm site has specified that faces are to be worked at an angle of 1v:2h (~29°) with a maximum face height of 13.5m. In order to assess the stability of these faces computer analysis of what is considered to be the most unfavourable slopes in the design has been performed.
- 8.1.2 The analysis along with a description of the parameters used in the design is given in Appendix A to this report. Two analyses have been performed the first shows a 10kN/m² surcharge at the crest of the slope in order to assess the impact of the A452 of slope stability, the second shows a 3m high bund 1m from the crest of the face acting as a surcharge.
- 8.1.3 In both cases the minimum factor of safety of the slope is 1.22. The lowest factor of safety is for relatively small scale, shallow face failures. The factor of safety for a full face circular failure is ~1.3 and failures affecting the road have a factor of safety in excess of 1.8.

APPENDIX A

Park Farm: Notes on SLIDE analyses

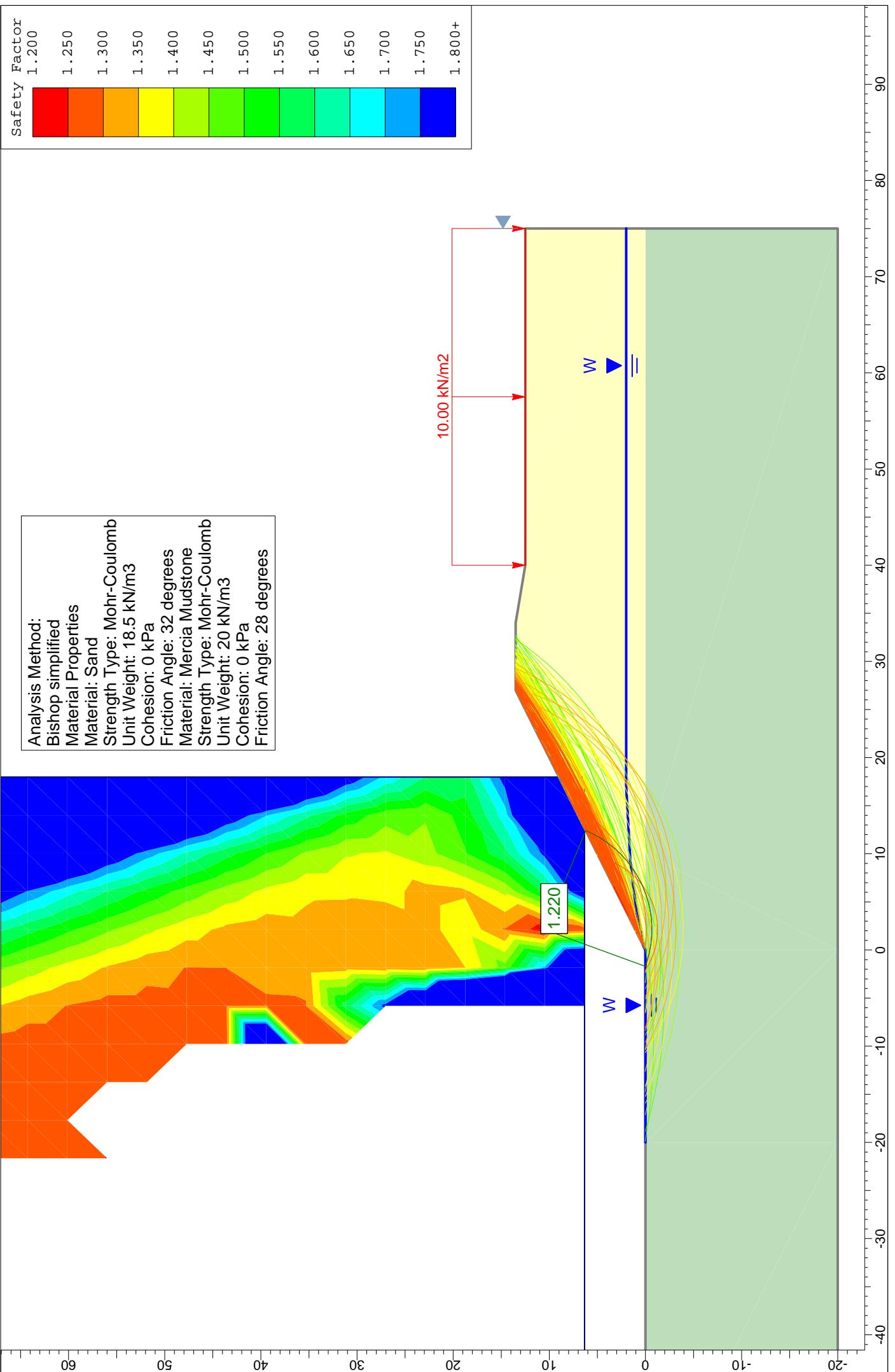
Park farm is the proposed location for a new sand and gravel pit in Glacial Sand and Gravel. The field observations at Park Farm suggest that the deposit comprises an upper sand unit and a lower sand and gravel unit. The upper sand has been described as a slightly silty to silty fine to medium grained quartz sand with occasional quartzite pebbles that is some 1.8m to 7m in thickness. The lower sand and gravel has been described as fine to coarse quartz sand with well rounded quartzite gravels and occasional cobbles. These deposits have been described as loose soils and no discontinuities have been identified.

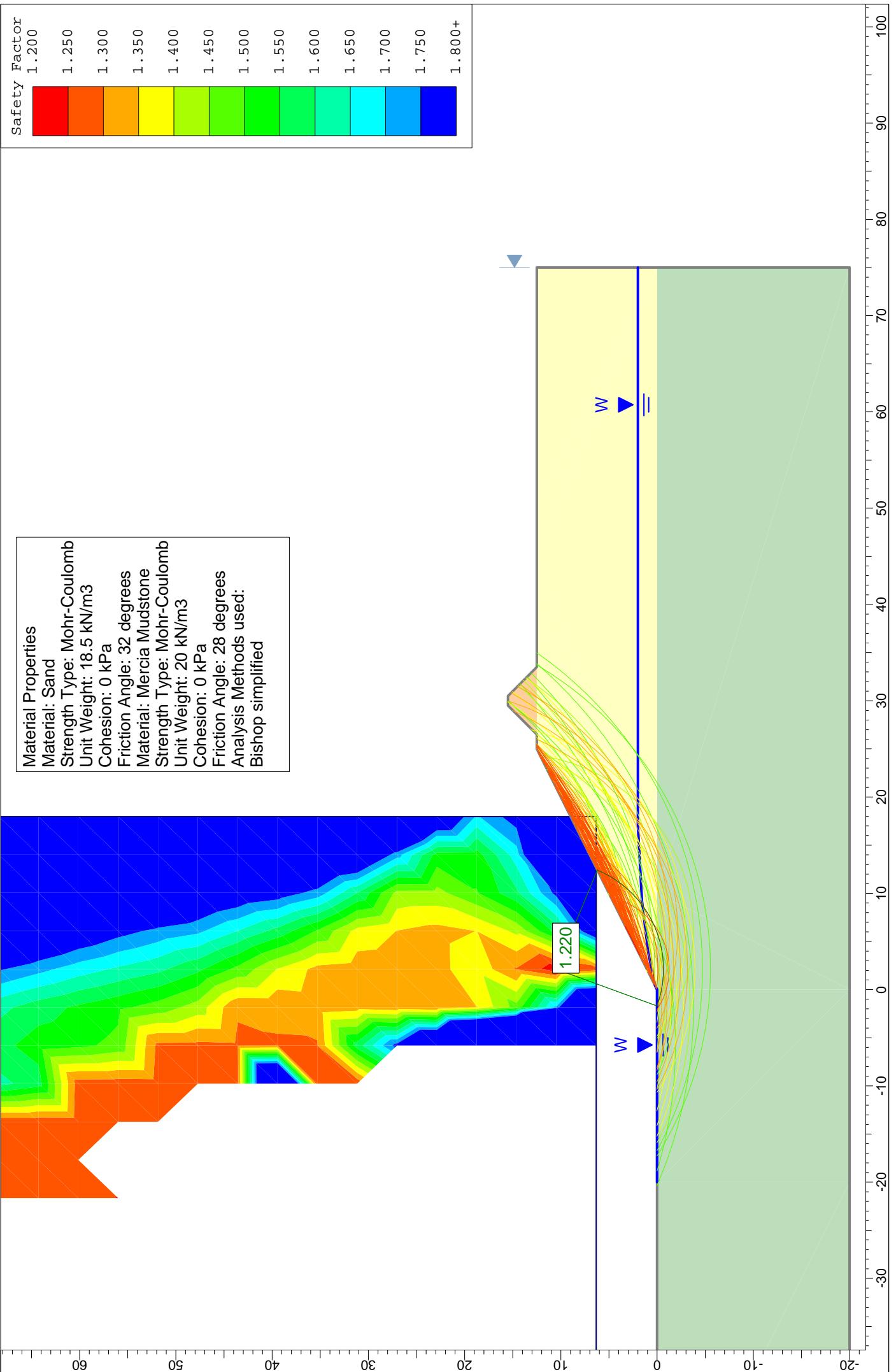
In order to assess the likely slope stability of the cut faces with an active Park Farm quarry a worst case scenario has been assumed, taking into account and potential loading of the crests with soil bunds and the effect traffic on the neighbouring A452 may have. A uniform set of parameters have been used for the sand and sand and gravel units. The parameters for the sand have been used as they represent a worst case scenario for the slope as a whole. The stability of a soil slope is controlled by the friction angle and the cohesion between the grains. The guidance for soil strength parameters given in BS 8002 (Code of practice for earth retaining structures, 1992) suggests an appropriate friction angle for a rounded, moderately graded sand or sand and gravel to be 32° . It has also been assumed that these soils have a cohesion = 0 as they have been described as loose sands and silt/clay contents are generally <5%. The unit weight of the sand has been estimated as 18.5 kN/m^3 .

The same assessment method has been applied to the Mercia Mudstone bedrock, which has been given a friction angle = 28° as it is thought to be a low plasticity clay and a cohesion = 0 and a unit weight of 20 kN/m^3 . These parameters are intentionally conservative due to the lack of detailed field description and laboratory test data. Groundwater monitoring data for the site suggests that a perched water table exists in the lower 2m of the deposit. For the analysis a 1v:2h slope has been used, which is the angle the quarry face has been designed at and a maximum face height of 13.5m has been used. Figure 1 shows the analyses conducted with a 10 kN/m^3 surcharge behind the face in order to incorporate any potential destabilising factors caused by the A452 road. Figure 2 shows the analyses conducted with a 3m high soil bund constructed 1m from the crest of the slope.

These analyses indicate a minimum factor of safety for the slope in both cases of 1.22. The lowest factors of safety for the slope are mostly representative of shallow face failures, with the chance of a larger scale circular failure towards the toe of the face. Large scale circular face failures have a factor of safety of ~ 1.3 and failures affecting the road have a factor of safety in excess of 1.8. Figure 2 shows that the existence of a bund on the crest of a face should not decrease the minimum factor of safety of the slope. These results are thought to be appropriate for the proposed development but should be reassessed in the event of any significant design changes to the proposed faces.

It may be possible given geotechnical test data of the materials or higher resolution analysis of specific slopes on site to steepen these faces while maintaining a suitable factor of safety. However given the generalised nature of the analysis it is important that the faces are inspected for any signs of instability once exposed and reassessed if necessary.





FIGURES & PLANS

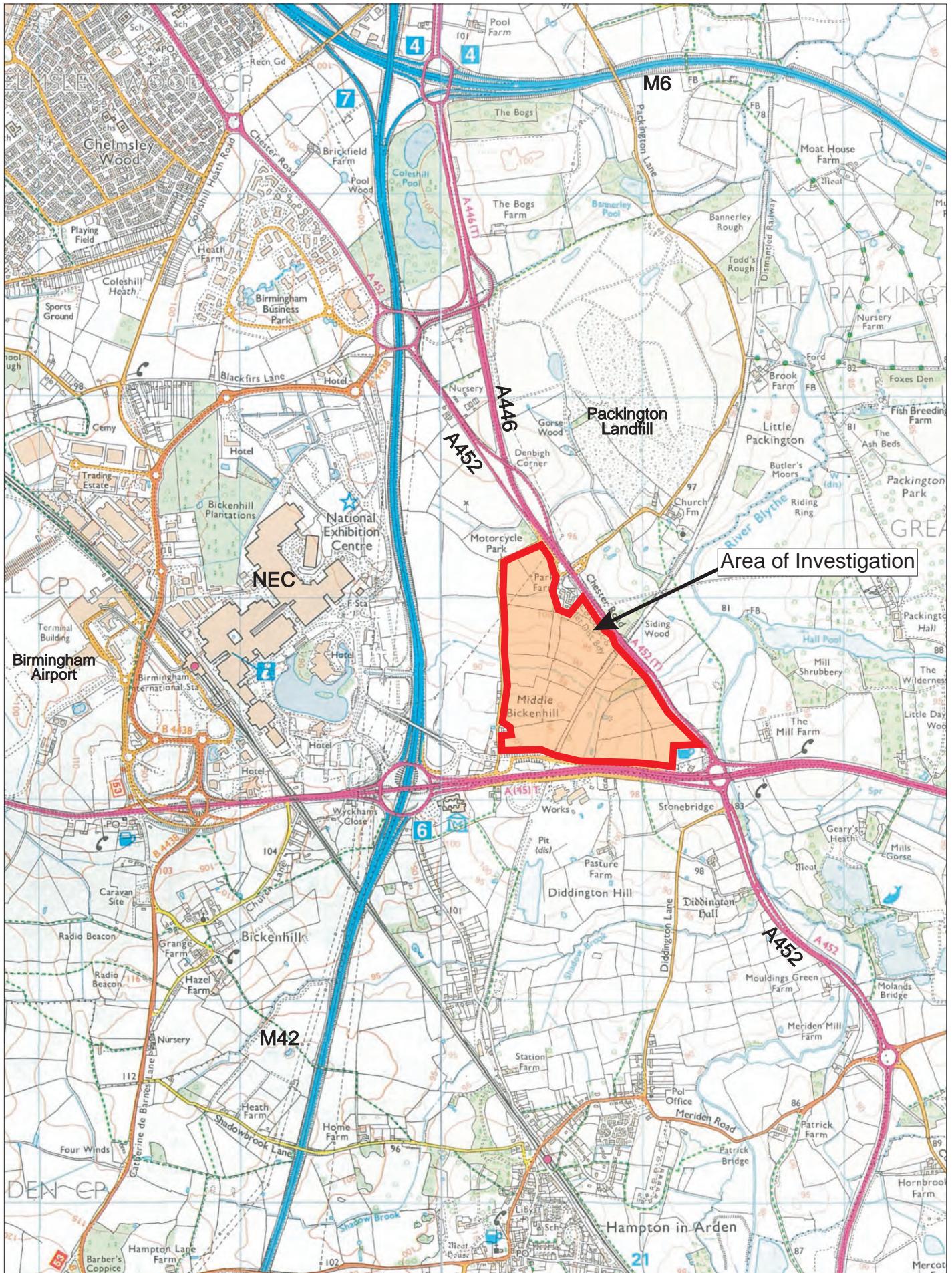


Figure F1

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Title
Site Location

Project No. TPE/PKF/101 Scale 1:25,000

Client Packington Estate Enterprises Ltd

Project Geological Assessment 2011

Site Park Farm



Greenfield

associates
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Nottingham, NG12 5JS
Tel: (0115) 9372002 Fax: (0115) 9376096
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Key

PKF1
Borehole Locations

Area of Investigation

Figure F2

Site Plan & Borehole Locations

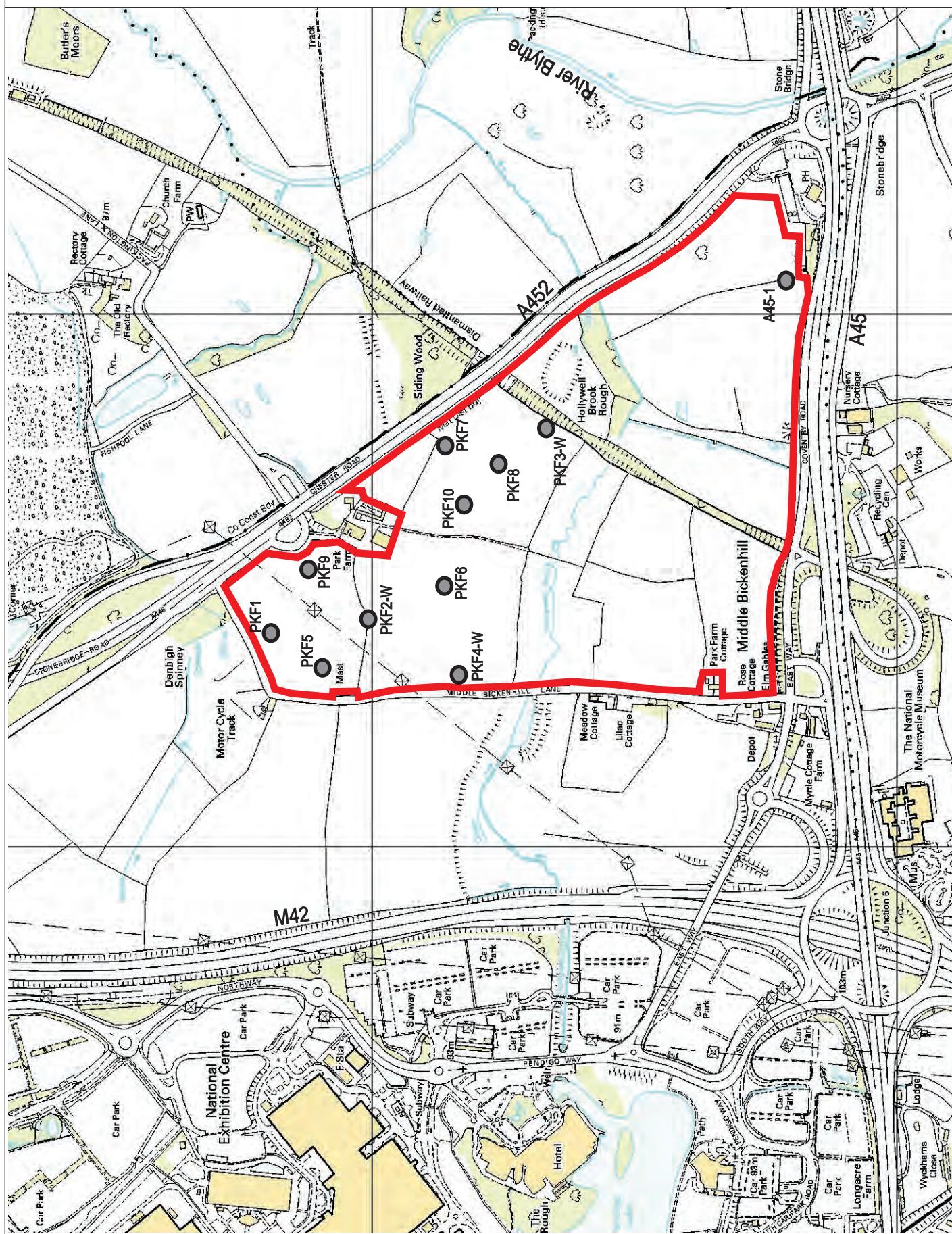
Project No. TPE/PKF101 | Scale 1:10,000

Client Packington Estate Enterprises Ltd
Project Geological Assessment
Site Park Farm

PACKINGTON ESTATE ENTERPRISES LIMITED
TRAX
AGGREGATES LTD

Greenfield

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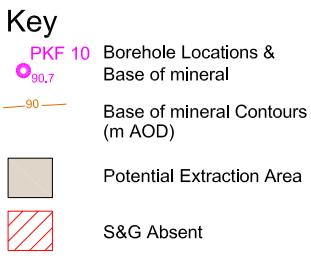




Park Farm, Bickenhill

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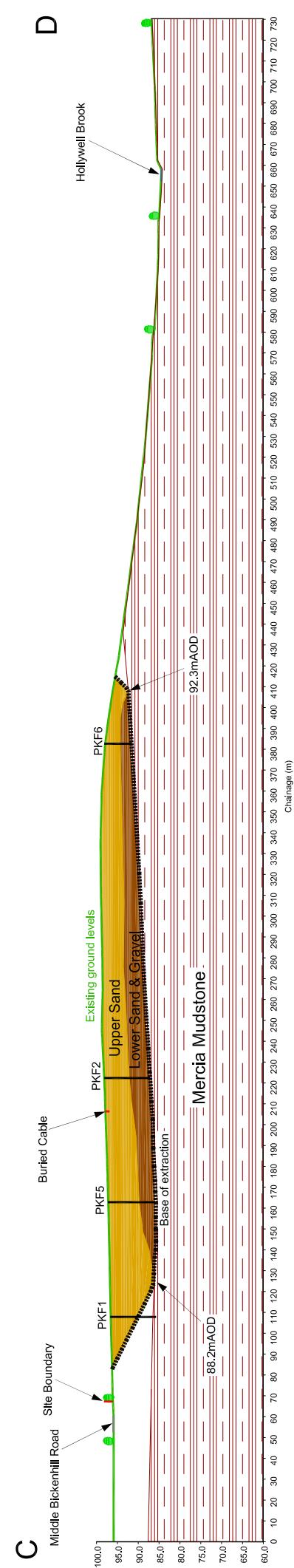
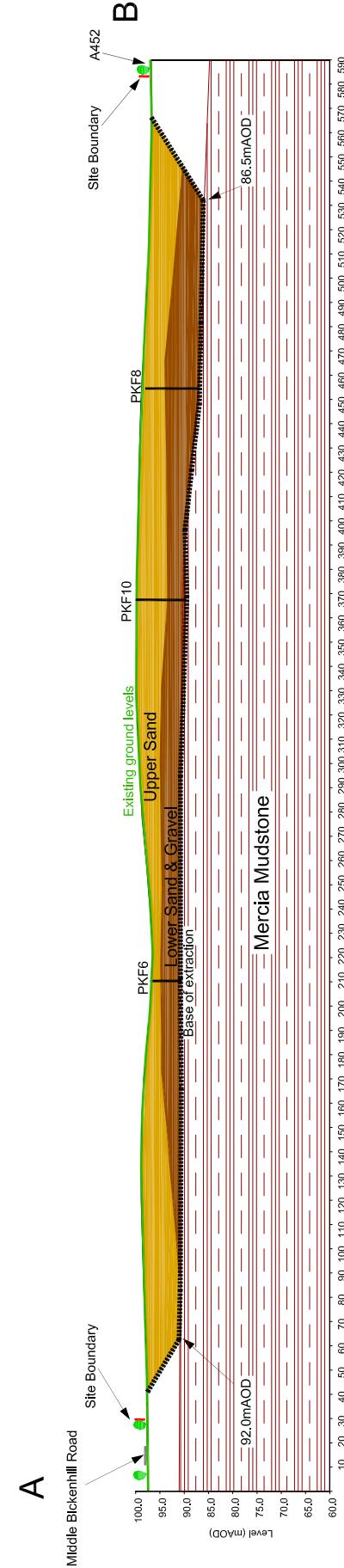
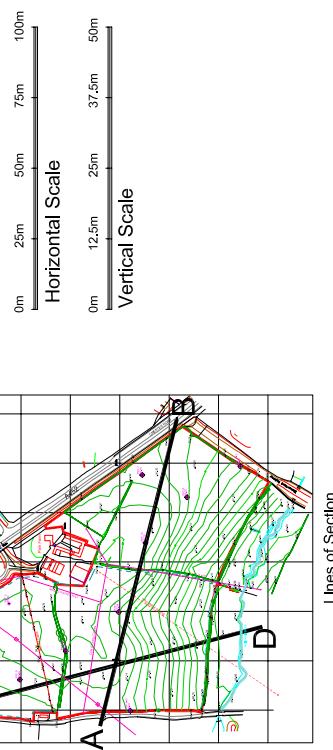
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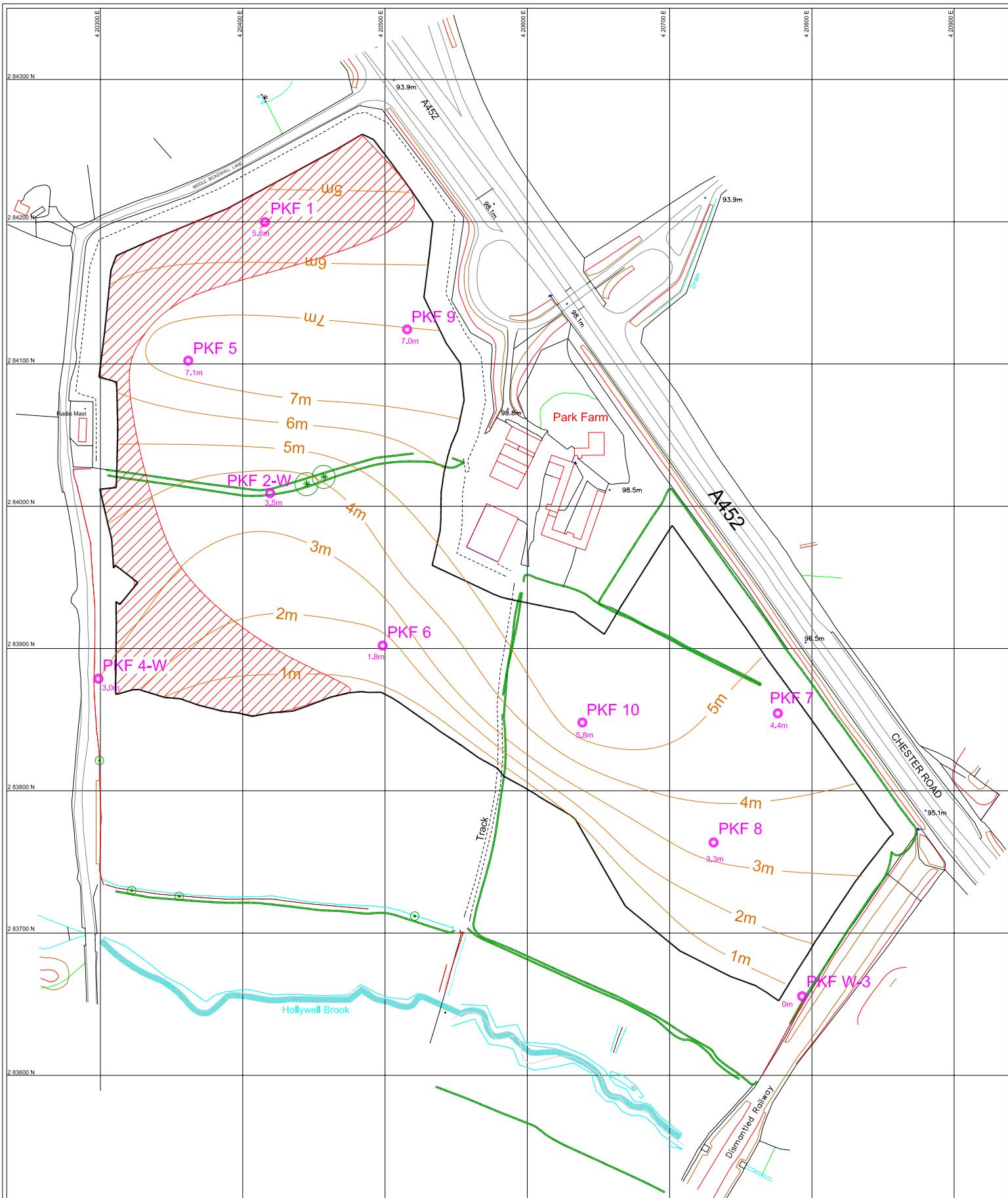
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Site
Park Farm, Bickenhill

Title

Figure F5
Upper Sand
Thickness Contours

0m 25m 50m 75m 100m
Scale

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File: F5 Park Farm Sand thickness

Project No. PFM/SI/100

Scale: NTS

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Site

Park Farm, Bickenhill

Title

Figure F6 Lower Sand & Gravel Thickness Contours

A horizontal scale bar representing distance. It features five major tick marks labeled '0m', '25m', '50m', '75m', and '100m' at regular intervals along a black line. Below the line, the word 'Scale' is written in a small, bold, black font.

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File: F6 Park Farm S&G thickness
Project No. TPE/PKF/100
Scale: NTS
Drawn by: SJR Date: 24th February 2011



PKF 8

Borehole Locations



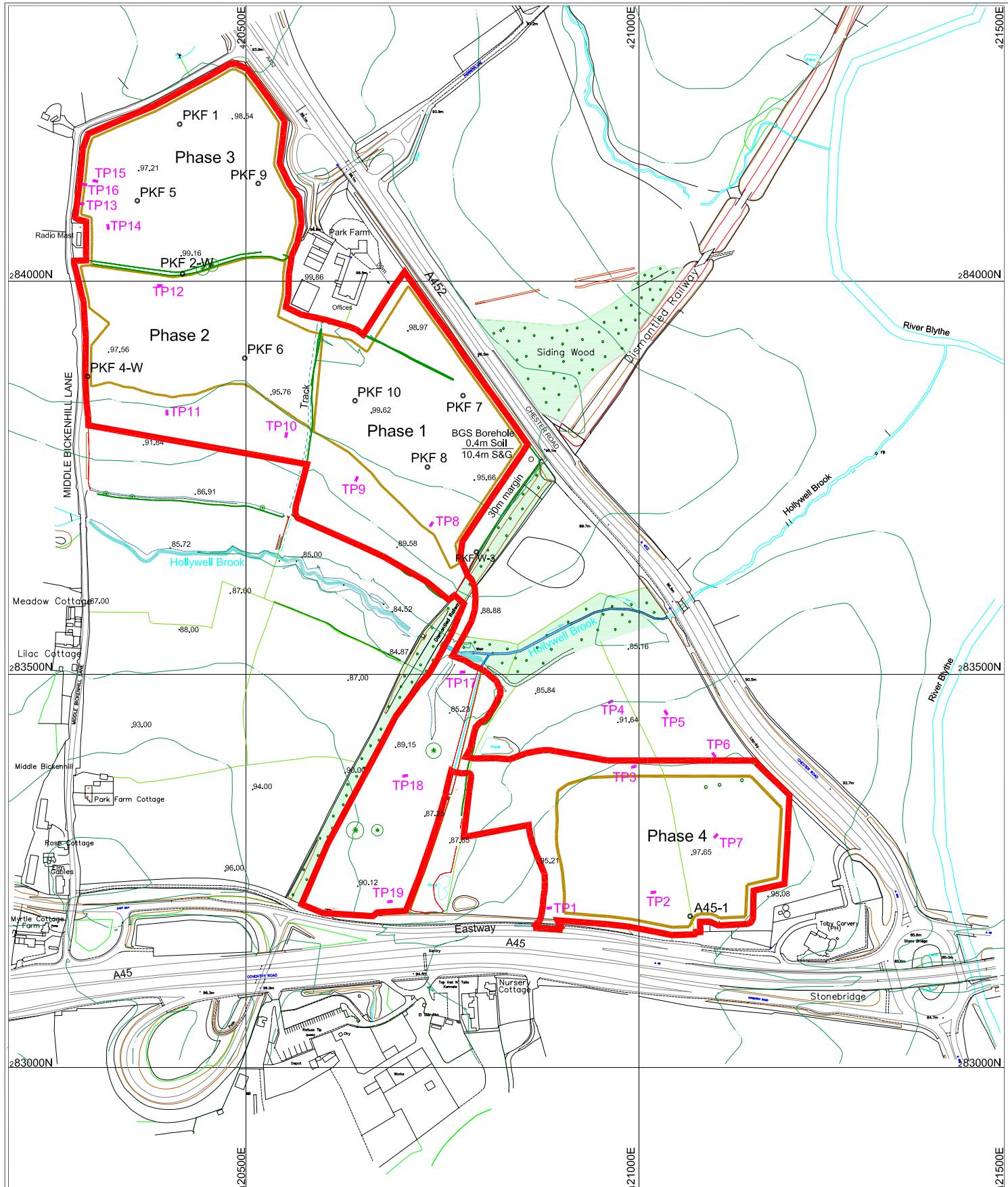
Extraction Area



S&G Absent

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Site
Park Farm, Bickenhill

Project
Planning Application

Title
Plan ES Geol 1

Extraction Areas

Borehole & Trial pit
Locations

KEY

- Proposed Planning Boundary
- Woodland
- TP1 Trial pit location
- A45-1 Borehole Location
- Extraction Areas

0m 50m 100m 150m 200m
Scale

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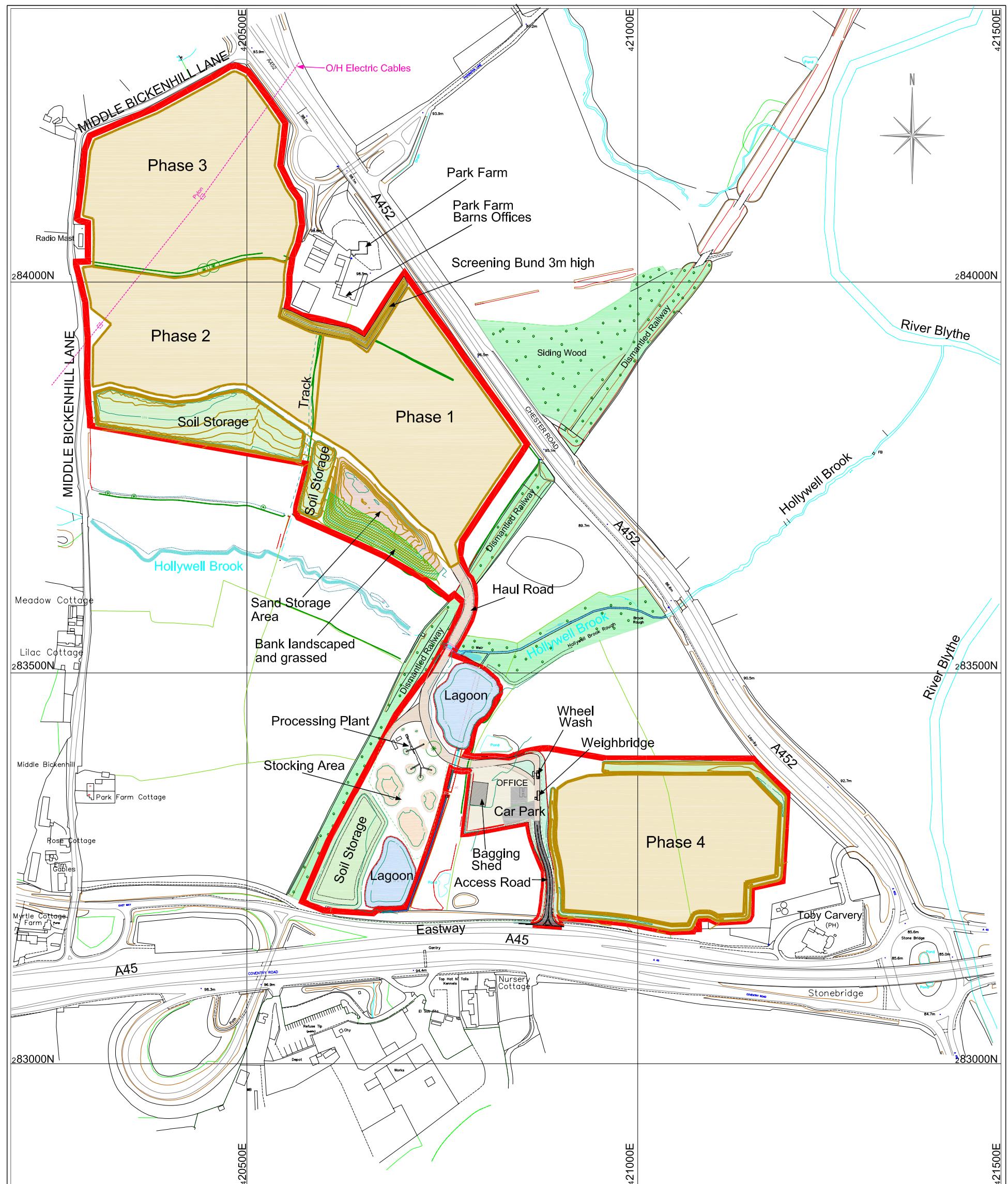
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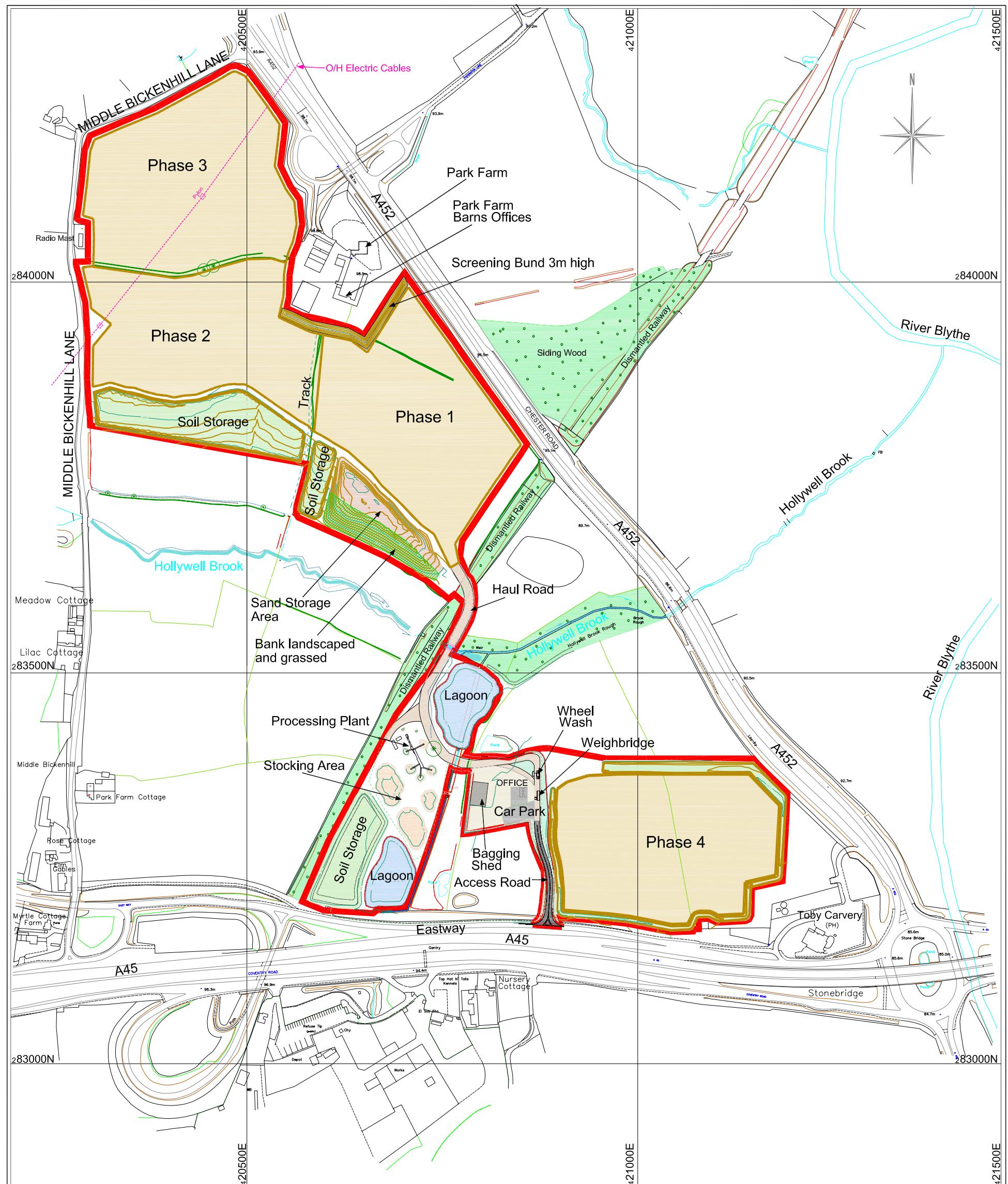
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<p>Site Park Farm, Bickenhill</p> <p>Project Planning Application</p> <p>Title Plan PF11-4 Proposed site layout & phasing scheme</p>	<p>KEY</p> <table border="1"> <tr> <td>—</td><td>Proposed Planning Boundary</td></tr> <tr> <td>—</td><td>Proposed extraction area</td></tr> <tr> <td>—</td><td>Bunds</td></tr> <tr> <td>● ● ●</td><td>Woodland</td></tr> <tr> <td>—</td><td>Extraction Area</td></tr> <tr> <td>—</td><td>Sand storage bund</td></tr> <tr> <td>—</td><td>Bank Landscaped and Grassed</td></tr> </table> <p>0m 50m 100m 150m 200m Scale</p>	—	Proposed Planning Boundary	—	Proposed extraction area	—	Bunds	● ● ●	Woodland	—	Extraction Area	—	Sand storage bund	—	Bank Landscaped and Grassed	<p>Based upon the 2010 Ordnance Survey 1:2,500 map with the permission of The Controller of Her Majesty's Stationery Office. © Crown Copyright. Site Surveyed by Greenfield Associates on 11/1/11 Greenfield Associates, 1 Commercial Road, Keyworth, Nottingham, Licence No. AL 51161A0001. The copyright of this drawing and its contents are the sole property of Greenfield Associates and must not be copied or shown to third parties without prior consent of the Company or its clients.</p>	<p>TRAXX AGGREGATES LTD</p> <p>PACKINGTON ESTATE ENTERPRISES LIMITED</p> <p>Greenfield associates</p> <p>1 Commercial Rd, Keyworth, Nottingham, NG12 5JS Tel: (0115) 937 2002 Fax: (0115) 937 6096</p>
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